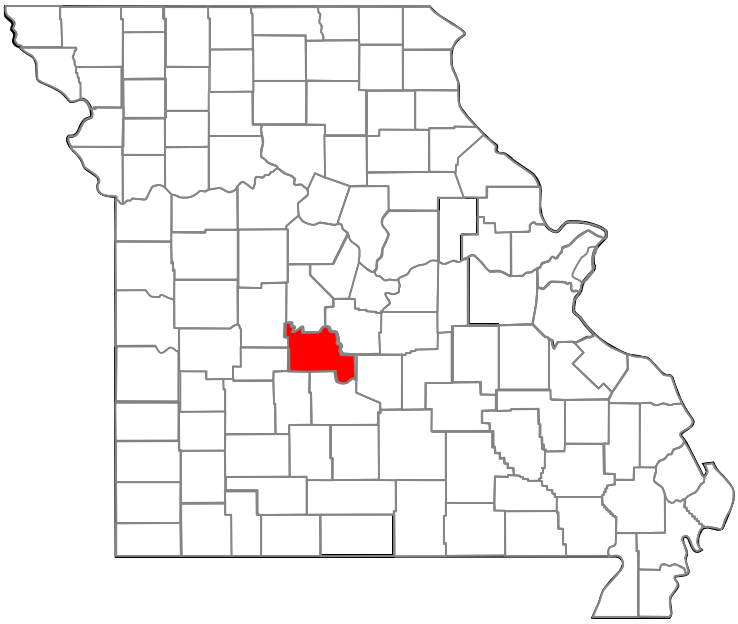
SITE INSPECTION REPORT

CAMDENTON TREATMENT PLANT LAGOON SITE

JULY 31, 2019



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Prepared By:
Missouri Department of Natural Resources

Division of Environmental Quality

Environmental Remediation Program

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DATE:	**Date July 31, 2019**
PREPARED BY:	**Michael Stroh, Missouri Department of Natural Resources**
SITE:	**Camdenton Treatment Plant Lagoon, Camden County**
EPA ID:	**MON000706666**
C.A. NUMBER:	**V99738108**

1.0 INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Missouri Department of Natural Resources (Department), through a Cooperative Agreement with the U.S. Environmental Protection Agency (EPA), conducted a Site Inspection (SI) at the Camdenton Treatment Plant Lagoon (CTPL) site in Camdenton, Missouri.

A potential for release of trichloroethene (TCE) was identified at a former wastewater treatment lagoon in Camdenton based on the discharge of industrial wastewater containing TCE to the lagoon between 1988 and 1989. The lagoon was closed in 1989 and a new wastewater treatment plant (WWTP) was constructed in the same area.

The objective of the SI was to assess potential threats to human health and the environment at the site, and if appropriate, to gather data necessary for the preparation of a preliminary site score under the EPA's Hazard Ranking System (HRS) for proposal to the National Priorities List (NPL). The investigation included the screening of lagoon waste, collection of outdoor ambient air, groundwater and soil gas samples adjacent to the WWTP operations building on December 19, 2018, and collection of shallow groundwater samples on April 17, 2019.

2.0 SITE DESCRIPTION

2.1 Location and Description

The CTPL site, also known as the C.P. White Lagoon, is the former location of an eight-acre, two-cell wastewater treatment lagoon built in the early 1960s and operated by the city of Camdenton.

The address is 1164 Ha Ha Tonka Road in Camdenton, Missouri and the geographical coordinates are 37.990862 N decimal degrees latitude, -97.766473 W decimal degrees longitude as measured using a Trimble GeoXT Explorer GPS with differential post-processing correction. Figure 1 provides a one-mile radius site location map with an inset showing the approximate boundaries of the former lagoon, as provided by City of Camdenton Public Works (Jefferies, 2019). A portion of the former lagoon now serves as a 4.5-acre stormwater retention pond and overflow basin. The area immediately surrounding the lagoon is maintained as an open field. Following closure of the lagoon, the southern portion of the area was redeveloped as the location of the Camdenton's current wastewater treatment plant (WWTP) (Figure 1).

The site lies in a narrow wooded valley at the confluence of two unnamed intermittent streams. The valley floor topography is flat and vegetated with grasses and wetland plants. Access to the site is through a lockable gate on a dead-end road. Surface water runoff flows to the northern portion of the former lagoon which now serves as a storm water collection pond (Figure 1). The WWTP discharges through two outfalls into an unnamed stream northwest of the former lagoon. The specific discharge point(s) from the former lagoon is not known, but based on topography, would likely have been in this same area. The unnamed stream continues for approximately 0.5 miles before entering the Niangua arm of Lake of the Ozarks. The treatment plant, shown in Figure 2 includes an 800 ft^2 office building with 3 full time employees (Jefferies, 2018). There are two residences within 0.25 miles of the CTPL; the nearest one is 350 feet to the east on a ridge above the valley.

The Camdenton area receives an average of 42.32 inches of precipitation annually, and an average of 19 inches of snowfall annually. The 2-year 24-hour rainfall is estimated at 3.5 inches. The average daily temperature during the summer months is 77 ºF, and the average winter temperature is 35 ºF. The average wind speed and direction is approximately 10 miles per hour from the south (NOAA, 2019).

2.2 Operational/Site History and Previous Investigations

The CTPL was one of several individual treatment lagoons operated by the city to receive and treat sources of wastewater prior to opening a centralized WWTP in June 1989. The WWTP is located in the same area as the CTPL. One of the other city lagoons, City Lagoon #3 (also known as the Hulett Lagoon), received a mixture of domestic wastewater and effluent from a refrigeration coil manufacturing facility located at 221 Sunset Drive, located approximately 600 feet southwest of Lagoon #3 (Figure 1). The 221 Sunset Drive facility used TCE as a degreasing agent, and releases of TCE from the facility to Lagoon #3 in the plant's wastewater discharge resulted in contamination of the sludge, surrounding soils and groundwater beneath the lagoon (Wilder, 1999). Following the initial discovery by the City of Camdenton of TCE contamination in Lagoon #3 in 1984, the city completed a cleanup at Lagoon #3 in 1989 involving the removal of 2,395 cubic yards of contaminated sludge and soil (Wilder, 1999). The lagoon was subsequently closed by filling with soil scraped from a nearby slope.

Releases of TCE at the 221 Sunset Drive facility, Lagoon #3 and potentially other associated locations in the Camdenton area lead to the contamination of one of the city's public wells with TCE. The Mulberry Well, located approximately ¼ mile southeast of the facility, was taken offline by the city on February 2, 1999, following discovery of TCE contamination in a sample from the well. Various rounds of investigation and cleanup have been conducted at the facility, Lagoon #3 and other locations in Camdenton since 1999, continuing to present day.

The Department is currently working with the responsible parties under two separate orders to address TCE contamination in Camdenton associated with the 221 Sunset Drive facility (EPA ID: MOD062439351) and Lagoon #3 (aka Hulett Lagoon, EPA ID: MOSFN0703530) where waste from the facility was discharged (MDNR, 2016 & MDNR, 1999). Responsible parties include the City of Camdenton, UTC Aerospace Systems (corporate successor to Sundstrand Tubular Products, Inc. who operated the facility at the time of the TCE usage), and the Modine

Manufacturing Company (owner of the facility subsequent to 1990 when TCE use was discontinued).

The Department held a public meeting on September 28, 2017, to address citizen questions and concerns about TCE contamination in the Camdenton area. Following the meeting, a public citizen concern group was formed. The Camdenton Industrial TCE Contamination Advisory Team (CITCAT) was convened and subsequently met on October 18, 2017. Members of the CITCAT recommended the Department investigate other potential areas of TCE release associated with the 221 Sunset Drive facility, including the CTPL (CITCAT, 2017). CITCAT group members expressed concern that the CTPL may have received TCE-contaminated wastewater effluent from the 221 Sunset Drive facility.

The Department initiated and completed a Pre-CERCLA Screening investigation for the CTPL site in 2018. Historical records indicate that following disconnection of City Lagoon #3 from the 221 Sunset Drive facility in December 1987, the facility's wastewater was rerouted to the CTPL. As noted, the CTPL was closed on June 8, 1989, when the WWTP became operational. Therefore, during an 18-month period between December 1987 when City Lagoon #3 ceased operation and June 1989 when the WWTP began operation, the CTPL received industrial wastewater effluent from the 221 Sunset Drive facility. During this same period, the facility operated a wastewater pre-treatment system designed to remove heavy metals prior to discharge. Available discharge volume and effluent TCE concentration data were used to estimate the mass of 17 kilograms of TCE, which may have been released to the CTPL in wastewater effluent from the 221 Sunset Drive facility over this 18-month period (Stroh, 2018). Based on the potential release of hazardous substances to the CTPL, the Department recommended further CERCLA assessment.

3.0 WASTE CHARACTERISTICS

Releases of TCE-contaminated wastewater to the CTPL are suspected to have occurred over an 18-month period in 1987 and 1989. Contaminants of concern (COCs) include TCE and its

daughter products 1,1-dichloroethene (1,1-DCE), cis- and trans- 1,2-dichloroethene (cis-1,2-DCE & trans-1,2-DCE), and vinyl chloride (VC). Using the maximum TCE result measured in the manufacturing facility's pre-treatment system effluent as a conservative value and the average daily discharge volume from the facility, the total mass of TCE potentially released to the CTPL over the 18 month period of concern is estimated at 17 kilograms (Stroh, 2018). However, as described in the conceptual site model (CSM) provided in the Sampling and Analysis Plan (MDNR, 2018), the TCE would have been dissolved in the wastewater discharge from the plant, which when combined with the overall inflow to the lagoon would have been diluted significantly. Additional losses would be expected to occur through volatilization to the atmosphere from the lagoon surface, especially during warm weather. Natural biotic degradation processes would have further reduced the TCE concentrations. The mass of TCE likely released to the CTPL was therefore very different at the City Lagoon #3 location which received discharges from the plant for a much longer period of time, and included discharge of sludges, waste oils, corrosive wastes and TCE waste prior to the installation of the pretreatment system at the facility.

3.1 Trichloroethene

The following is a summary of information in the Toxicological Profile for Trichloroethene (ATSDR, 2015). Trichloroethene is a nonflammable, colorless liquid at room temperature with a somewhat sweet odor. It is mainly used as a solvent to degrease metal parts, but is also used in some household products including paint removers, adhesives, and spot removers. TCE is a very commonly used chemical, and about 400,000 workers are routinely exposed to it in the United States. TCE quickly evaporates at room temperatures, and is most commonly released to air from industrial processes. It can also enter soil and water when disposed at chemical wastes sites. The compound is only slightly soluble in water. It is a dense non-aqueous phase liquid (DNAPL), which has a higher density than water.

Once released to the atmosphere, TCE will persist for several hours to several months, until being broken down by sunlight. In surface water, most TCE evaporates within several hours to several weeks. Because it is denser than water, any remaining TCE will settle to the bottom of the water body. It is not likely to bioconcentrate in aquatic life, or adsorb significantly to sediments and soils. In soils, due to its volatility and low adsorption to soil, TCE will evaporate quickly and/or rapidly leach into the groundwater. Once in the groundwater, liquid TCE will migrate downward until meeting an impermeable layer. Microbial degradation of TCE in groundwater can produce cis- 1,2- dichloroethene, 1,1- dichloroethene and vinyl chloride.

TCE exposure is most common through ingestion of contaminated drinking water, inhalation of vapors or direct contact of the solvent with skin. Acute exposure to high levels of TCE can cause dizziness, sleepiness, headaches, and skin rashes. There is strong evidence that TCE can cause kidney cancer in people and some evidence for liver cancer and malignant lymphoma. The International Agency for Research on Cancer (IARC) and EPA have classified TCE as carcinogenic to humans. EPA designates TCE as a CERCLA hazardous substance with a reportable quantity pursuant to the Clean Water Act, Clean Air Act and Resource Conservation and Recovery Act (RCRA).

4.0 WASTE SOURCE SAMPLING

Soil/sludge in subsurface beneath the lagoon was screened to assess the potential presence of residual TCE and daughter products. At boring location SB-01, five-foot soil cores were collected from the surface to 20 feet below ground surface and screened for VOCs in one-foot intervals using a photoionization detector (MDNR, 2018). No detections of VOCs were measured. Based on the PID screening results, together with the non-detect results for TCE from shallow groundwater samples (discussed in Section 5.4), no further waste source sampling was conducted.

5.0 GROUNDWATER PATHWAY

5.1 Hydrogeologic Setting

There are several sites of known or potential TCE release in Camdenton including all those discussed in Section 2.2. The Missouri Geologic Survey (MGS) has prepared hydrogeologic reports for one of these sites known as the Camdenton Sludge Disposal Area which is located approximately 4 miles east of the CTPL the site (Elfrink, 1999). The MGS also prepared a hydrogeologic report for the overall Camdenton TCE Sites (Bachle, 2017). Information in these two reports were used to provide a summary of the hydrogeologic setting of the CTPL site.

A stratigraphic column figure is included in the 1999 report (Elfrink, 1999). In the Camdenton area, soluble portions of the Roubidoux have generally been removed by dissolution creating highly karstic conditions.

Underlying the Roubidoux Formation, the Gasconade Dolomite consists of cherty dolomite and is estimated to be approximately 280 feet thick in the vicinity of the site. A basal unit of the Gasconade Dolomite, known as the Gunter Sandstone Member, commonly separates the Ordovician- and Cambrian-age strata. The Gunter Sandstone is approximately 25 feet thick in the area. The Gunter Sandstone is generally highly porous and permeable and is an important source of domestic groundwater supplies in the area. Because the Gunter Sandstone generally yields adequate domestic water supplies, few private wells in the area penetrate the underlying Cambrian Formations. However, municipal wells in the Lake of the Ozarks area are generally cased through the Gunter Sandstone, in order to avoid possible bacterial contamination.

A series of dolomite and sandstone formations comprise the Cambrian bedrock units beneath the site. The Davis shale layer is present within this unit and forms a partial confining unit; although it may not be fully contiguous across the area. The entire Cambrian section is estimated to be over 1,150 feet thick. All Cambrian-age units above the Davis shale are considered the Ozark Aquifer.

In general, the Ozark Aquifer produces good-quality water, with production rates generally proportional to well depth. The total aquifer thickness is approximately 950 feet, and it is the major source of municipal drinking water in the Camdenton area.

The shallowest reliable aquitard beneath the site is the St. Francois Confining Unit, approximately 1,150 feet below the surface. The St. Francois Confining Unit separates the Ozark Aquifer from the deeper St. Francois Aquifer. The St. Francois Aquifer is not used as a water source in Camden County.

The Eminence and Potosi Dolomites are a major source of municipal drinking water throughout the Ozark area, including the City of Camdenton. The Eminence Dolomite is differentiated from the underlying Potosi Dolomite by the lack of druse. A druse is a rock cavity encrusted with finely crystalline quartz. The druse-rich Potosi Dolomite is the most permeable geologic unit within the Ozark Aquifer and generally has an extensive network of karstic channels.

Since the Mulberry Well is located approximately 1.25 mile northeast (upgradient), it is unlikely that the CTPL site would contribute contamination to the Mulberry Well. The CTPL site is approximately ¾-mile southwest from the Blair Heights public well (Figure 1). Due to the existence of dissolution channels in the bedrock, and the unknown extent of the capture zone for the Blair Heights Well, there is a possibility that contaminants originating at the CTPL site could impact the Blair Heights Well, however, the likelihood is low since the well is up gradient from the site. Based upon static water level data from the Logmain and Well Information Management System (WIMS) databases, there is a steep groundwater gradient toward the Lake of the Ozarks. Therefore, if there were any dissolved phase chlorinated solvent plume from the CTPL site, it most likely will migrate west, toward the lake.

5.2 Groundwater Targets

Residents in the City of Camdenton, population 4,000, obtain drinking water from a public system drawing water from the Ozark Aquifer. There are also a number of nearby private wells listed in MGS databases in areas not served by the public surface water supply system. Municipal and public water supply districts cover a small portion of the 4-mile well survey area. Therefore, most residential homes and businesses outside of Camdenton and the water supply districts may have a private drinking water well (MDNR, 2017).

The Ozark aquifer produces up to 750 gallons per minute and is known to provide water for 510 recorded wells within 4 miles of the site. Because the Ozark Aquifer generally yields adequate domestic water supplies, few private wells in the area penetrate to the underlying Cambrian Formations. Municipal wells in the Lake of the Ozarks area are generally cased into the Gunter Sandstone, in order to avoid possible bacterial contamination from surface water infiltration (Bachle, 2017).

The MGS databases contain records of 18 non-community public, 29 community public, 4 municipal, and 459 domestic wells within a 4-mile radius of the CTPL site. Some wells listed in the Logmain database may no longer be used. Prior to 1987, registry of private wells was not required, so some existing older wells may not be included in the database. Because of these exceptions, the databases may not accurately depict water well usage in this area (Bachle, 2017).

The nearest domestic drinking water well on record to the site is located approximately 0.25 miles east of the site (Figure 1). However, the aerial photograph basemap in Figure 1 also shows a residential property approximately 380 feet northeast of the lagoon on top of a ridge overlooking the valley. It is likely, but not confirmed, that this residential property would have a domestic drinking water well. The nearest public well in MGS databases is Blair Heights Well located approximately ¾ miles northeast of the site. There are 10 active non-community water systems

and 12 community public wells within 4 miles of the site. Table 1 below provides a summary of the population served by public and private wells in various distance radii from the site.

5.4 Groundwater Sampling and Results

The Dawson Metal Products #2 (Dawson #2) site is another Camdenton TCE release site located approximately 0.5 miles northeast of the CTPL site (Figure 1). A Site Inspection investigation was conducted at the Dawson #2 site in 2017 (Branson, 2019). That SI included sampling of 17 private drinking water wells in the vicinity of the CTPL site and no TCE was detected in any of them. Therefore, no additional private well sampling was included in the scope of the CTPL SI investigation.

Table 1: Estimated Population Served By Groundwater Within Four Miles of the Camdenton Treatment Plant Lagoon Site[1]

Distance (In Miles)	Number and Type of Public Wells	Total Population Served By Public Wells	Number of Private Wells	Total Population Served by Private Wells[2]	Total Population Served By Groundwater
0-1/4			1	2	2
>1/4-1/2			4	9	9
>1/2-1	Blair Heights Well	1240	5	11	11
>1-2	(2) Municipal Wells	1484	115	269	3618
	(4) Non-community Public Wells	455			
	(6) Community Public Wells	1410			
>2-3	(1) Non-community Public Wells	75	155	362	1207
	(4) Community Public Wells	770			
>3-4	(1) Municipal Wells	244	177	417	1811
	(2) Non-community Public Wells	690			
	(2) Community Public Wells	460			
TOTAL		**6828**	**457**	**1070**	**7898**

[1] Table values taken from Addendum Hydrogeologic Report for Camdenton TCE Sites (Bachle, 2017), and are approximate.

[2] The number of people served per private well was estimated by multiplying the average household size of 2.34 persons per household in Camden County by the number of wells within a distance category (USCB, 2016).

On December 19, 2018, one shallow groundwater grab sample was collected from boring SB01 located west of the WWTP operations building as shown in Figure 2 (Counihan, 2019a). Following collection of soil cores from 0 to 20 feet below ground surface, the Geoprobe® rods were pulled up and a five foot section of Schedule 40 PVC well screen was lowered into the open boring and connected with solid sections of pipe up to the ground surface. A water level probe was used to record a water depth of 11 feet below ground surface. A peristaltic pump was used to

purge the borehole water into a flow-through cell where it was monitored for temperature, pH, and specific conductivity until the parameters were shown to be stable before collecting a sample for volatile organic compound analysis. Analytical results are provided in Appendix C. No TCE or daughter products were detected in the water sample.

On April 17, 2019, five shallow groundwater samples were collected within the bermed area of the former lagoon north of the treatment building (Counihan, 2019b). At the seven locations shown in Figure 3, Geoprobe® rods were advanced to refusal. Refusal was observed at depths between 8 and 17 feet below ground surface, with shallower refusal depths measured toward the northeast corner of the lagoon cell and deeper refusal depths to the southwest. At each location, upon refusal, the rod string was retracted four feet exposing a screenpoint sampler the subsurface. Groundwater levels were measured and the screen point sampler was purged before sample collection as described above. Groundwater was observed at depths of 2.8 to 13 feet below ground surface. At boring locations SB07 and SB10, no groundwater entered the screenpoint sampler. All samples were analyzed for TCE and daughter products on-site using a mobile gas chromatograph. Samples from two of the locations (SB05 and SB06) were also submitted to the Department's laboratory for VOC analysis. Analytical results are provided in Appendix C. No TCE or daughter compounds were detected in any of the samples.

5.5 Groundwater Conclusions

A shallow saturated zone is present within the overburden in the former CTP lagoon area. Six shallow groundwater samples were collected from boring locations near the treatment plant building and within the bermed area of the former lagoon north of the building. Sample analysis show that no TCE or daughter compounds are present in shallow groundwater from these areas. Therefore, no release of TCE to shallow groundwater was documented at the site.

6.0 SURFACE WATER PATHWAY

The CTPL ceased receiving wastewater effluent from the 221 Sunset Drive facility in 1989. It is possible that during the period when the lagoon was receiving the TCE-containing effluent (1987 to 1989), a release to surface water could have occurred through overtopping of the lagoon berm into the unnamed stream north of the lagoon. However, due to a number of factors, such a potential release was not considered to warrant further assessment of the surface water pathway: 1) the release would have occurred 30 years ago, 2) TCE is a volatile compound with an estimated half-life in surface water of minutes to hours (EPA, 2001), 3) if such a release occurred, it would have been due to a significant rainfall event which would further dilute any TCE in the lagoon water. Due to these considerations, the surface water pathway was not evaluated as part of the SI investigation.

7.0 SOIL EXPOSURE AND SUBSURFACE INTRUSION PATHWAY

The subsurface intrusion pathway, also known as the vapor intrusion pathway refers to the process of subsurface contaminant vapors entering into occupied building structures and causing exposure to building occupants through inhalation. This pathway was identified as the primary pathway of concern at the CTPL site. TCE is a volatile compound which can migrate through the subsurface away from its point of release and at sufficient concentrations, under the right conditions result in vapor intrusion.

7.1 Physical Conditions

The native soil in the vicinity of the CTPL Site is the Cedargap Series, a well-drained alluvial silt loam containing up to 65 percent chert gravel. Following closure of the lagoon, the site was graded and gravel was brought in to level the site in preparation for construction of the WWTP. A soil boring was collected at location SB01 from 0-20 feet below ground surface near the WWTP operation building during the SI investigation (Photographs 1-4, Appendix B). Alternating intervals of gravel and silty clay were observed from the surface to approximately 6 feet, followed

by a 4 foot interval of gravel. Alternating gravel and silty clay layers were again observed between 6 and 13 feet, followed by all brown silty clay to 20 feet. The gravel observed did not appear to be the native chert described in the soil Cedargap soil series, but rather crushed limestone or dolomite, likely imported as fill material when the area was redeveloped. Soil cores were screened for VOCs at one foot intervals using a photoionization detector (Counihan, 2019). No significant VOC levels were measured. Saturated conditions were observed beginning at approximately 11 feet below ground surface.

7.2 Soil and Air Targets

The site is located in a valley. The nearest residential property is approximately 380 feet northeast (upgradient) of the lagoon on top of a ridge overlooking the valley. The nearest occupied building, and therefore the nearest potential target for the subsurface intrusion pathway, is the WWTP operations building located on top of the former CTPL (Figure 2). There are 3 full-time employees at the WWTP who regularly occupy this building during a typical 40-hour workweek (Jefferies, 2018).

7.3 Subsurface Intrusion Pathway Sampling

In order to determine whether TCE is present in the subsurface of the former lagoon area, soil samples were screened for VOCs from the surface down 20 feet below ground surface, and soil gas and shallow groundwater samples were collected and analyzed.

7.3.1 Outdoor Air Sampling

One outdoor air sample was collected from a location approximately twenty feet west of the WWTP operations building to establish whether TCE was present in the ambient air around the lagoon (Figure 2). The SAP specified that the outdoor air sample would be collected into a 6-liter summa canister over an 8-hour period. However, due to a miscommunication with the laboratory, only 1-liter canisters were shipped for the sampling event. Therefore, the outdoor air sample was collected over a period of approximately 10 minutes into a 1-liter Summa canister (the same as the soil gas samples) and submitted to Eurofins laboratory in Folsom, CA for analysis of volatile

organic compounds by EPA Method TO-15. The SAP specified the samples would be submitted for analysis of only the contaminants of concern at the site (TCE and associated degradation products). However, the samples were mistakenly submitted for a full TO-15 target compound list analysis.

7.3.2 Soil Gas Sampling

A total of eight soil gas samples were collected from two depths at each of four locations; one on each side of the WWTP operations building (Figure 2). One sample was collected approximately 10 feet below ground surface, just above the saturated zone, and a second sample from a depth of 5 feet below ground surface. Samples were collected using a Geoprobe® and a post-run tubing system (Counihan, 2019). Three borehole volumes of soil gas were purged and each boring was checked for leaks using a helium shroud prior collecting samples into 1-liter Summa canisters. A co-located soil gas sample was collected at boring location SB01. Samples were submitted to the Eurofins laboratory in Folsom, CA for analysis of volatile organic compounds by EPA Method TO-15.

7.4 Results/Discussion

Complete analytical results are provided in Appendix C. No TCE or associated degradation by product compounds were detected in any of the samples. However, as noted in Section 6.3.1, the samples were submitted for the full Method TO-15 target compound list consisting of 67 VOCs. Additional VOCs unrelated to the potential release of TCE being investigated were detected in each sample at levels below health-based benchmarks. These additional VOCs, which primarily include aromatic and aliphatic hydrocarbons associated with petroleum-based fuels, are likely present in the soil gas due to incidental releases related to the use of vehicles and heavy equipment at the WWTP. The fact that they were not detected in the shallow groundwater sample collected during the investigation indicate that there has not been a significant mass of petroleum released to the subsurface at the site. Additionally, some of these same VOCs were also detected below health-based benchmarks in the outdoor air sample collected near the building.

7.5 Soil Exposure and Subsurface Intrusion Pathway Conclusions

Analysis of soil gas samples collected from multiple depths in the area where the CTPL was formerly located revealed no detections of TCE or associated degradation products. Therefore, no release of TCE to the subsurface was documented. The absence of contaminants of concern in the shallow soil gas adjacent to the building indicates that there is no risk of exposure to building occupants through the vapor intrusion pathway.

8.0 DATA QUALITY ASSESSMENT

8.1 Groundwater Sampling

Trip blanks accompanied the sampling team during both sample collection events, returned to the Department's laboratory, and was submitted for analysis of VOCs. No VOCs were detected. A duplicate groundwater sample was collected from boring location SB01. No VOCs were detected in either sample.

8.2 Soil Gas Sampling

Helium leak checks at each boring location were well below the 1% of shroud concentration criteria demonstrating no intrusion of atmospheric air into the soil gas samples (Counihan, 2019).

9.0 SUMMARY AND CONCLUSIONS

The Camdenton Treatment Plant Lagoon site, also known as the C.P. White Lagoon, is the former location of an eight-acre, two-cell wastewater treatment lagoon built in the early 1960s and operated by the city of Camdenton. Historical records indicate that industrial wastewater containing TCE from a refrigeration coil manufacturing facility at 221 Sunset Drive in Camdenton was discharged to the lagoon during an 18-month period between December 1987 and June 8, 1989 when the lagoon was closed. Based on available discharge information from the facility, the lagoon may have received wastewater containing TCE concentrations up to 2,230 µg/L during this time period. The plant includes one occupied building with 3 full-time employees. In response to

public concerns about TCE contamination in the Camdenton area, a Site Inspection investigation was initiated to determine whether there was a release of TCE at the CTPL site and to evaluate potential exposure pathways.

The primary exposure pathways of concern identified at the site are the groundwater/drinking water and soil exposure/subsurface intrusion pathways. There are records of 457 private domestic drinking water wells within 1-mile of the CTPL. Recent private well sampling conducted during assessment of the nearby Dawson Metal Products #2 site showed no detections of TCE at 17 wells, including two wells within 0.25 miles of the CTPL site. Six shallow groundwater samples were collected from within the footprint of the former lagoon during the investigation, and no TCE or breakdown products were detected in any of the samples.

Screening of soil cores collected from within the lagoon footprint was conducted at 1-foot intervals from the surface down 20 feet. No VOCs were detected in the soil cores. Eight soil gas samples were collected from near the WWTP operations and maintenance building and analyzed for TCE and daughter products. None were detected. There is no risk of TCE exposure to CTPL employees at the WWTP through the vapor intrusion pathway.

Based on results from this investigation, no release of TCE or daughter products was documented at the CTPL site, and no further action under CERCLA is warranted at this time.

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SIGNATURES

Prepared by:

Michael Stroh
Environmental Specialist
Site Assessment Unit
Hazardous Waste Program

Approved by:

Martin Kator
Unit Chief
Site Assessment Unit
Hazardous Waste Program

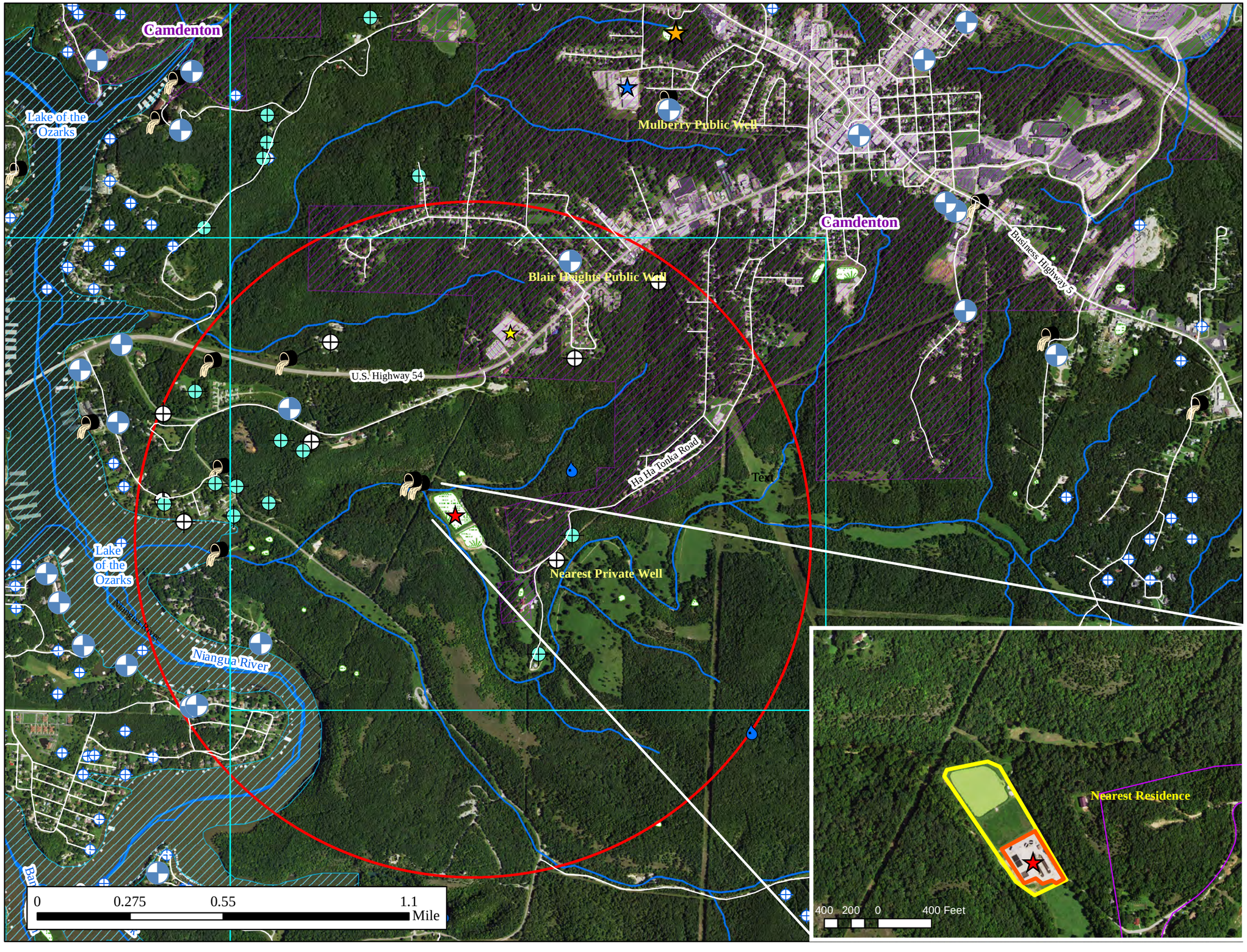
Valerie Wilder
Chief
Superfund Section
Hazardous Waste Program

Date: July 31, 2019

APPENDIX A

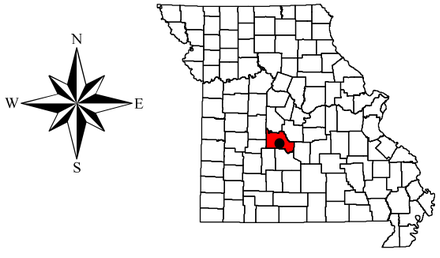
Figures

Figure 1: Site Location Map
Camdenton Treatment Plant Lagoon
Camden County, Missouri



Legend

- Camdenton Treatment Plant Lagoon
- One Mile Radius Ring
- Public Wells
- Private Wells Beyond 1 Mile Radius Ring
- Private Wells Sampled in 2017 (Dawson #2 Site)
- Unsampled Private Wells Within 1 Mile of Site
- NPDES Outfalls
- City Lagoon #3
- 221 Sunset Drive Facility
- Dawson Metal Products #2 Site
- Former CTPL Lagoon Boundary
- Camdenton WWTP
- Camdenton Municipal Boundary

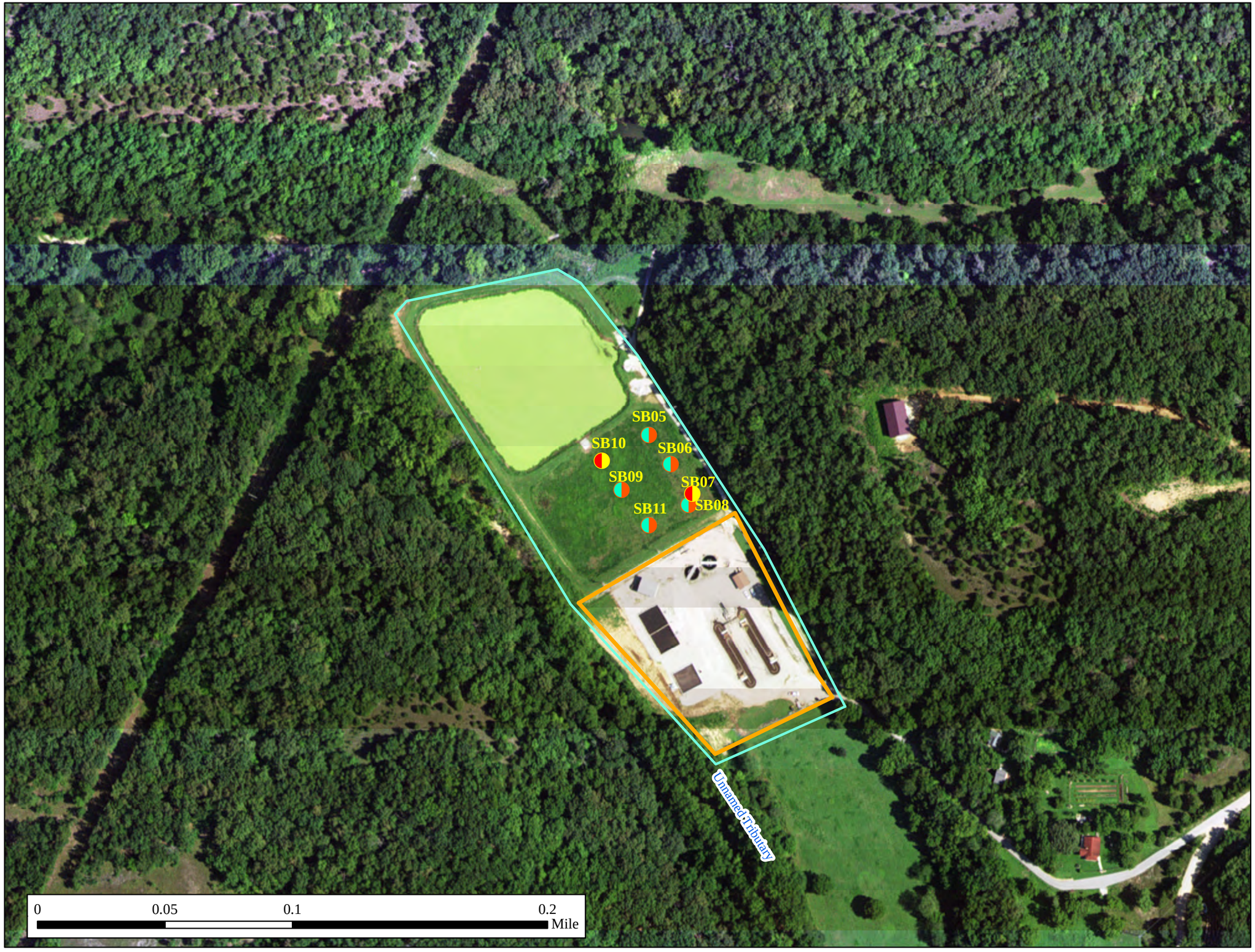


Created on: November 8, 2018 by Michael Stroh.
This map is located at M/Superfund/Camdenton Treatment Plant Lagoon/Figure1 Site Location Map
Base Map: National Agriculture Imagery Program (NAIP) ortho photography. Flight Date: 2016

MISSOURI DEPARTMENT OF NATURAL RESOURCES

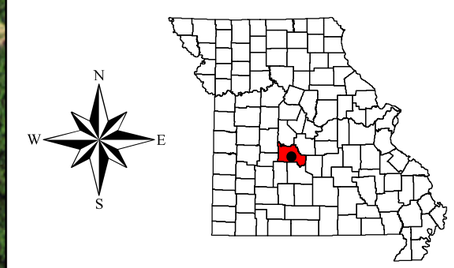
Figure 2: December 19, 2018 Sampling Locations
Camdenton Treatment Plant Lagoon
Camden County, Missouri

Figure 3
April 17, 2019
Groundwater
Grab Sampling Locations
Camdenton Treatment Plant Lagoon (CTPL)
Camden County, Missouri



Legend

- Groundwater Sampled
- Groundwater Not Obtained
- CTPL (former)
- Camdenton Treatment Plant



Created on: August 8, 2018 by Amanda Branson.
This map is located at M/Superfund/Camdenton Treatment Plant Lagoon/Figure2 Treatment Plant Map

Base Map: National Agriculture Imagery Program (NAIP) ortho photography. Flight Date: 2014
Data Sources: US Census 2010;
Missouri Department of Transportation

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APPENDIX B

Photographs

Camdenton Treatment Plant Lagoon Site Inspection Photo Log

All photographs taken on December 19, 2018 by Michael Stroh, MDNR

Photograph 1. Soil core from boring SB-01, 0’ to 5’.

Photograph 2. Soil core from boring SB-01, 5’ to 10’.

Photograph 3. Soil core from boring SB-01, 10’ to 15’.

Photograph 4. Soil core from boring SB-01, 15’ to 20’.

Photograph 5. Location of boring SB-01 on the west side of the WWTP operations building

Photograph 6. Location of boring SB-02 on the south side of the WWTP operations building

Photograph 7. Location of boring SB-03 on the east side of the WWTP operations building

Photograph 8. Location of boring SB-04 on the north side of the WWTP operations building. Collection of soil gas samples from 5’ and 10’ bgs.

Photograph 9. Collection of soil gas sample from Boring SB-01

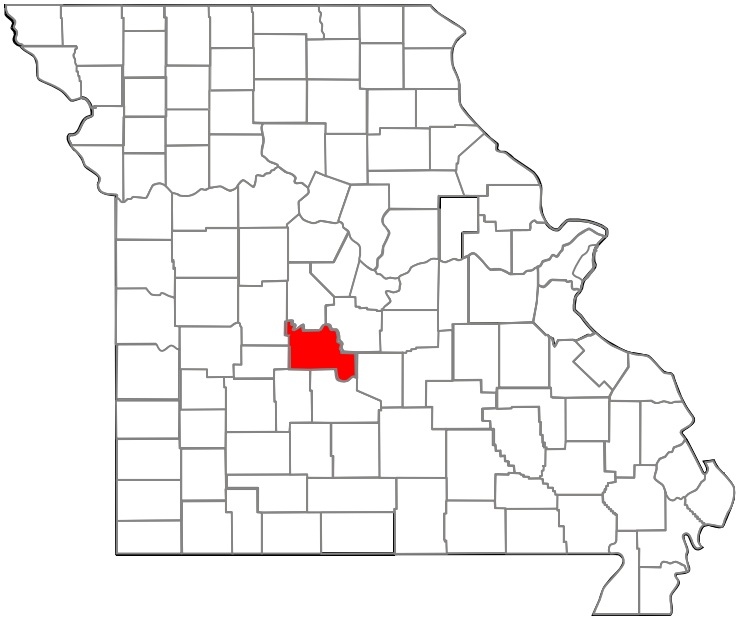
APPENDIX C

Sampling Documentation

SITE INSPECTION SAMPLING AND ANALYSIS PLAN

Camdenton Treatment Plant Lagoon Site
Camden County, Missouri

December 17, 2018



MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Prepared By:

Missouri Department of Natural Resources
Division of Environmental Quality
Hazardous Waste and Environmental Services Programs

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Tables

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1.0 Introduction

As authorized under the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986, the Missouri Department of Natural Resources (Department), Hazardous Waste Program (HWP), Site Assessment Unit (SAU) is conducting a Site Inspection (SI) at the Camdenton Treatment Plant Lagoon (CTPL) site. The CTPL site is the former location of a domestic wastewater treatment lagoon in Camdenton, Missouri.

The objective of the investigation is to assess potential threats to human health and the environment at the site and if necessary, gather data for the preparation of a preliminary site score under the Hazard Ranking System (HRS). The scope of the SI includes sampling of soil gas and shallow groundwater.

2.0 Site Information

2.1 Location

The CTPL site, also known as the C.P. White Lagoon, is the location of former eight-acre, two-cell wastewater treatment lagoon built in the early 1960s and operated by the city of Camdenton. The address is 1164 Ha Ha Tonka Road in Camdenton, and the geographical coordinates are 37.990862 decimal degrees latitude, -97.766473 decimal degrees longitude. Figure 1 provides a one-mile radius site location map with an inset showing the approximate boundaries of the former lagoon. Following closure, a portion of the lagoon was redeveloped as the location of the Camdenton's current wastewater treatment plant (WWTP) (Figure 1).

The site lies in a narrow wooded valley at the confluence of two unnamed intermittent streams. The valley floor topography is flat and vegetated with grasses and wetland plants. Access to the

site is through a lockable gate on a dead-end road. Surface water runoff flows to the northern portion of the former lagoon which now serves as a storm water collection pond (Figure 1). The WWTP discharges through two outfalls into an unnamed stream northwest of the former lagoon (Figure 1). The specific discharge point(s) from the former lagoon is not known, but would likely have been in this same area. The unnamed stream continues for approximately 0.5 miles before entering the Niangua arm of Lake of the Ozarks. The treatment plant includes an 800 ft^2 office building with 2 full time employees. There are two residences within 0.25 miles of the CTPL; the nearest one is 350 feet to the east on a ridge above the valley (visible in Figure 2).

2.2 Site History/Operation

The CTPL was one of several individual treatment lagoons the city maintained prior to opening a centralized WWTP in June 1989. The WWTP, visible in Figure 2, is located in the same area as the CTPL. The lagoon was one of several operated by the city to receive and treat sources of wastewater within the City of Camdenton prior to the opening of the WWTP in 1989. One of the other city lagoons, City Lagoon #3 (also known as the Hulett Lagoon), received a mixture of domestic wastewater and effluent from a refrigeration coil manufacturing facility located at 221 Sunset Drive, located approximately 600 feet southwest of Lagoon #3 (Figure 1). That facility used TCE as a degreasing agent, and releases of TCE from the facility to Lagoon #3 in the plant's wastewater discharge resulted in contamination of the sludge, surrounding soils and groundwater beneath the lagoon (Wilder, 1999). Following the initial discovery by the City of Camdenton of TCE contamination in Lagoon #3 in 1984, the city completed a cleanup at Lagoon #3 in 1989 involving the removal of 2,395 cubic yards of contaminated sludge and soil (Wilder, 1999). The lagoon was subsequently closed by filling with soil scraped from a nearby slope.

Releases of TCE at the 221 Sunset Drive facility, Lagoon #3 and potentially other associated locations in the Camdenton area lead to the contamination of one of the city's public wells with

TCE. The Mulberry Well, located approximately ¼ mile southeast of the facility, was taken offline by the city on February 2, 1999, following discovery of TCE contamination in a sample from the well. Various rounds of investigation and cleanup have been conducted at the facility, Lagoon #3 and other locations in Camdenton since 1999, continuing to present day.

The department is currently negotiating with the responsible parties on an agreement to address TCE contamination in Camdenton associated with the 221 Sunset Drive facility. Responsible parties include the City of Camdenton, UTC Aerospace Systems (corporate successor to Sundstrand Tubular Products, Inc who operated the facility at the time of the TCE usage), and the Modine Manufacturing Company (owner of the facility subsequent to 1990 when TCE use was discontinued).

The department held a public meeting on September 28, 2017, to address citizen questions and concerns about TCE contamination in the Camdenton area. Following that meeting, a public citizen concern group was formed. The Camdenton Industrial TCE Contamination Advisory Team (CITCAT) was convened and subsequently met on October 18, 2017. Members of the CITCAT recommended the department investigate other potential areas of TCE release associated with the 221 Sunset Drive facility, including the CTPL (CITCAT, 2017). CITCAT group members expressed concern that the CTPL may have received TCE-contaminated wastewater effluent from the 221 Sunset Drive facility.

The Department initiated and completed a Pre-CERCLA Screening investigation for the CTPL site in 2018. Historical records indicate that following disconnection of City Lagoon #3 from the Sunset Drive facility in December 1987, the facility's wastewater was rerouted to the CTPL. As noted, the CTPL was closed on June 8, 1989, when the WWTP became operational. Therefore, during an 18-month period between December 1987 when City Lagoon #3 ceased operation and June 8, 1989 when the WWTP began operation, the CTPL received industrial wastewater

effluent from the 221 Sunset Drive facility. During this same period, the facility operated a wastewater pre-treatment system designed to remove heavy metals prior to discharge. Available discharge volume and effluent TCE concentration data were used to estimate the mass of TCE that may have been released to the CTPL in wastewater effluent from the Sunset Road facility (38 lbs) over this 18-month period (Stroh, 2018). Based on the potential release of hazardous substances to the CTPL, the Department recommended further CERCLA assessment.

3.0 Data Quality Objectives

To help ensure precise, accurate, representative, complete, and comparable data, all field work and analyses will be conducted in accordance with the Quality Assurance Project Plan (QAPP) for Pre-Remedial/Pre-Removal Site Assessments, Revision 8, December 29, 2017, and ongoing (MDNR, 2017). That QAPP is revised every 5 years and provides generic data quality objectives (DQOs) for the full range of CERCLA site assessment sampling activities the Department conducts. Those DQOs specific to this Site Inspection project are described below.

3.1 Problem Statement

For an 18-month period in 1988 and 1989, the Camdenton Treatment Plant Lagoon received industrial wastewater effluent from a refrigeration coil manufacturing facility located at 221 Sunset Drive in Camdenton. The facility used trichloroethene (TCE) to degrease metal parts during this period and the effluent entering the CTPL contained dissolved TCE. Based on the potential for release of a hazardous substance at the CTPL site, further CERCLA assessment is necessary to document the release and evaluate potential exposure pathways.

3.2 Planning Team

The planning team includes staff from the HWP Superfund Section, EPA Region 7, ESP Field Services and Chemical Analysis Sections, the Department of Health and Senior Services and the Missouri Geological Survey.

3.3 Conceptual Site Model

3.3.1 Site Setting

The depth and composition of the soil/residuum at the CTPL has not been documented. The native material in the general area is Roubidoux Formation residuum consisting of sandy red clay with chert fragments. No specific construction records for the CTPL are available, but the common practice was to line lagoon excavations with compacted clay to retard infiltration and retain wastewater to allow for settling of solids. It is not known whether wastewater solids or clay were removed from the CTPL prior to filling the lagoon in, and these materials may still be present. According to the Camdenton Director of Public Works, portions of the CTPL were backfilled with white rock prior to construction of the WWTP to a depth of up to 10 feet (Jefferies, 2018).

The unconfined Ozark Aquifer is present beneath the residuum. This aquifer consists of dolomite, sandy dolomite and sandstone and is known to be karstic. Public and private wells in the area obtain drinking water from the Ozark Aquifer. Depth to groundwater in the aquifer has not been determined at the CTPL, but based on measurements in area wells, is estimated to be approximately 150 feet below ground surface. Flow direction in the Ozark Aquifer is expected to be southwest toward the Lake of the Ozarks.

3.3.2 Contaminant Release

Releases of TCE-contaminated wastewater to the CTPL are suspected to have occurred over an 18-month period in 1988 and 1989. Contaminants of concern (COCs) include TCE and its daughter products 1,1-dichloroethene, cis- and trans- 1,2-dichloroethene and vinyl chloride. Using the maximum TCE result measured in the manufacturing facility effluent as a conservative value and the average daily discharge volume from the facility's pre-treatment system, the total mass of TCE potentially released to the CTPL over the 18 month period of concern is estimated at 17 kilograms (Stroh, 2018).

3.3.3 Contaminant Migration Pathways and Mechanisms

The TCE released to the CTPL was dissolved in the wastewater discharge from the Sunset Drive facility. The relatively small volume of the industrial discharge compared to the overall inflow of wastewater to the CTPL, would have resulted in significant dilution of the TCE. Additional reductions in TCE concentrations would likely have occurred through volatilization to the atmosphere from the lagoon surface, especially during warm weather. Natural biotic degradation processes are known to act on TCE and these may have further reduced TCE concentrations in the lagoon water. Small amounts of residual TCE present in the lagoon water may have percolated into the lagoon clay liner/overburden along with infiltrating wastewater, potentially entering shallow groundwater. Shallow groundwater recharge to the Ozark Aquifer locally at the CTPL could have contained some TCE.

If residual TCE is present at sufficient levels in the shallow subsurface at the CTPL, either in the clayey soil or in shallow groundwater, it could partition into soil gas. Shallow soil gas TCE contamination present beneath structures could enter the buildings through vapor intrusion.

3.3.4 Potential Receptors

The area surrounding the site is sparsely populated. The nearest residential properties are located to the east (350 feet away) and southeast (800 feet away) (Figure 1). Both of these properties have private drinking water wells. Private well sampling conducted as part of the Dawson Metals Products Site Inspection investigation identified and sampled 17 private wells in the vicinity of the CTPL (Figure 1). Two wells located near the CTPL were included in this sampling. No TCE was detected in any of the wells. Based on the small mass of TCE estimated to have been released to the CTPL and the lack of TCE detections in private wells in the vicinity, the groundwater/drinking water pathway is not expected to be of significant concern.

The nearest structure to the CTPL is the office building for the WWTP which was constructed over part of the former lagoon (Figure 1). There are two full-time employees in the office building working 8-hour day shifts.

3.4 Study Questions

The principal study question is to determine whether there are concentrations of COCs in shallow groundwater or soil gas adjacent to the Camdenton WWTP office building that could pose a risk to building inhabitants through the subsurface intrusion (SSI) pathway. A second question is whether TCE is present in groundwater beneath the CTPL near the bedrock surface where it could be an ongoing source to the deeper bedrock aquifer.

3.5 Inputs to Study Questions

The primary inputs required to address the principal study questions are:

- Soil logs documenting subsurface stratigraphy at the site.

- Concentrations of COCs in soil gas and shallow groundwater near the WWTP office building.
- Concentrations of COCs in groundwater at the bedrock surface.
- Health-based screening levels for COCs in soil gas and groundwater (Table 1).

Table 1. Vapor Intrusion Investigation Screening and Action Levels, Non-Residential

Compound	Soil Gas		Groundwater ug/l
	Screening Levels[1], ug/m	Action Levels[2], ug/m	
Trichloroethene (TCE)	100	290	7.4
cis-2,1-Dichloroethene	NA	NA	NA
trans-2,1-Dichloroethene	NA	NA	NA
1,1-Dichloroethene	29,000	29,000	820
Vinyl chloride	93	930	25

[1] Screening levels based on lower of cancer (1E-6) and non-cancer risk (HQ=1). All values obtained from EPA VISL webpage calculator (https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-levels-visls, accessed October 2018)

[2] Action levels are based on lower of cancer (1E-5) and non-cancer risk (HQ=1)

[3] Using an Attenuation Factor of 0.03

3.6 Study Boundary

Sampling will be limited to the area immediately surrounding the Camdenton WWTP office building. If significant subsurface contamination is identified, the investigation may be expanded. In that event, the scope and nature of the additional assessment will be described in a separate SAP amendment.

3.7 Decision Rules

If soil gas or shallow groundwater COC concentrations exceed the Table 1 VISL levels near the WWTP office building and indicate that the SSI pathway may be complete, access will be

requested to conduct subslab vapor and indoor air sampling as part of a subsequent phase of the SI (under an addendum SAP); otherwise no further assessment will be conducted. If COCs are present above screening levels in groundwater at the bedrock surface, additional groundwater characterization may be conducted as a separate phase of the SI under a SAP Addendum.

3.8 Tolerable Limits on Decision Error

The hypothesis of this investigation is that TCE and daughter products in soil gas are posing a health threat to inhabitants of nearby buildings through the vapor intrusion pathway. Falsely rejecting that hypothesis, considered a Type I decision error, would mean mistakenly concluding that the subsurface contamination does not pose a health threat. Falsely accepting this hypothesis, considered the Type II decision error, would mean concluding that the subsurface contamination poses a health threat when in fact it does not.

The Type I error could result in concluding that no action is necessary to reduce exposure when in fact the subsurface contamination is posing a health threat. A Type II error would potentially result in the recommendation for removal or remedial actions at the site which may not actually be necessary to protect public health. The Type I error is considered more severe since it could result in delaying actions needed at the site to protect public health.

Several measures will be taken to reduce the probability of making a Type I decision error. The use of a multiple lines of evidence approach will reduce the likelihood of committing either type of decision error. Results will be compared to EPA's vapor intrusion screening and action levels (VISLs) which are established using conservative toxicity, contaminant transport and exposure assumptions, further protecting against Type I errors. An exceedance of screening levels in either the deep or shallow soil gas will trigger additional assessment, even though deeper soil gas

results may overestimate potential risk in that it may not be representative of what could be present directly beneath a structure. This provides additional protection against Type I errors.

3.9 Sampling Design

Groundwater and soil gas migration are strongly controlled by subsurface conditions. Soil cores will be collected and logged to document these conditions and identify whether a shallow saturated zone is present. Soil gas data will be collected from deep (~20 feet or just above the saturated zone) and shallow (6 feet) depths to evaluate potential vertical attenuation. Results will be compared to EPA VISL screening levels established for subslab vapor. If exceedances are detected, access will be requested from the property owners to conduct subslab vapor and indoor air sampling to further evaluate the pathway. Groundwater will be sampled from near the top of the saturated zone in the overburden (if encountered) and from near the bedrock surface.

4.0 Field Activities

4.1 Sample Collection

Sampling activities will include the collection of soil cores, shallow groundwater and soil gas samples. Locational information will be collected for each sample using a Trimble GeoExplorer GPS and the data will be differentially post-processed.

4.1.1 Soil Cores

The proposed soil gas sampling locations are shown in Figure 2. At one of the locations, two-inch diameter soil cores will be collected using direct push technology. Cores will be collected in PVC Macro-Core liners at five (5) foot intervals from the surface to refusal. The cores will be screened for volatile organic compounds using a photoionization detector (PID). After removing each core sleeve from the rod, small diameter holes will be punched through the sleeve at 1 foot intervals, and the PID wand inserted into the core to collect a reading. The sleeve will then be cut open and the soil core logged.

4.1.2 Groundwater

At the same location where soil cores are collected, if high soil moisture conditions are observed indicative of a saturated zone, an attempt will be made to identify the depth to groundwater and collect a groundwater grab sample from near the top of the groundwater surface and another from near the bedrock surface. Following completion of the core logging, a five (5) foot section of slotted Schedule 40 PVC well screen will be lowered into the open boring and connected with solid sections of pipe up the ground surface. A water level probe will be used to record the depth to water below ground surface. If water is present, disposable ¼ inch polyethylene tubing will be lowered into the well screen and the well will be purged using a peristaltic pump. Three (3) borehole volumes of water will be removed at a rate of less than 500 ml/min. Groundwater will be screened for temperature, pH, and specific conductivity during purging. Readings will be collected every three minutes and once field measurements have stabilized (pH within 0.2 units, temperature and specific conductivity within +/- 10%), samples will be collected for laboratory analysis.

In the event that the open borehole collapses preventing the insertion of a well screen, shallow groundwater will be obtained using a screen point sampler. A second boring will be advanced a few feet from the soil core boring location using DPT and a Geoprobe® Screen Point 16 Groundwater Sampler. After advancing to the desired depth, the expendable rod drive tip will be released and the rods will be retracted approximately four (4) feet to expose the screen point sampler to the formation. A water level probe will be used to record the depth to groundwater below ground surface, and disposable ¼ inch polyethylene tubing will be inserted to the approximate depth of the screen point sampler. The boring will be purged and sampled as described above. Following sample collection, the boring will be plugged with granular bentonite and hydrated.

4.1.3 Soil Gas Sampling

Soil gas samples will be collected from two depths at four locations around the perimeter of the WWTP office building (Figure 2). Soil gas samples will be collected using DPT and a post-run tubing (PRT) system. Sampling depths will be determined based on observations made during soil core logging and shallow groundwater sample collection described above. An attempt will be made to collect a deep soil gas sample from just above the saturated zone if encountered, to a maximum of twenty (20) feet below ground surface, or from near refusal if encountered first. A direct push rig will be used to advance rods equipped with an expendable drive point to the target depth. The tip will be released and the rod string pulled back to expose a 1 foot interval of soil. Post-run tubing equipped with a threaded adaptor will be inserted through the rods and screwed into the expendable point holder at the end of the rod string forming a gas-tight seal. Hydrated bentonite will be placed around the rod at the ground surface to prevent intrusion of atmospheric air into the rod string. The dead volume of the tubing will be calculated based on tube diameter and length, and three volumes will be evacuated to purge the sampling point using a 100 ml plastic air tight syringe attached to the tubing with a three way valve.

Prior to collection of each soil gas sample, a leak check will be conducted. A shroud will be placed on the surface around the rod and bentonite seal and ultra-high purity helium will be introduced into the shroud to a concentration of 60% or greater. Using a 100 ml air tight syringe, soil gas will be collected and analyzed with a portable helium detector. A result of less than 1% of the initial helium concentration in the shroud will indicate a sufficient seal against intrusion of atmospheric air into the sample. Following a successful leak check, a 1-liter evacuated Summa canister will be attached to the post-run tubing and a soil gas sample collected at a rate of approximately 100 ml/min. Immediately following sample collection, the rods will be retracted, the boring plugged with hydrated bentonite, and the surface restored to the extent practical.

After collection of the deep soil gas sample, a second boring will be advanced approximately three (3) feet away to five (5) feet below ground surface and a shallow soil gas sample will be collected as described above.

Saturated soil conditions prevent collection of soil gas samples. Saturated conditions will be indicated in the field by soil core observations and difficulty experienced in purging and collecting soil gas. In some conditions, water can be observed in the tubing during purging or sample collection which will prevent sample collection. If such conditions are encountered, the rods will be retracted at intervals until soil conditions amenable to sampling are observed.

4.2 Sample Nomenclature

Soil gas samples collected from soil boring locations will be named using the following format; SG-xx-yy, where xx is the boring number starting with 01 and yy is the depth the expendable rod tip is driven to. Groundwater grab samples will be named GW-xx-yy, using the same convention as soil gas.

4.3 Sampling Order

The soil core logging and groundwater grab sampling will be conducted first. Soil gas samples will be collected in no particular sequence after that.

4.4 Sample Analysis

Groundwater samples will be submitted to the Department's analytical laboratory in Jefferson City for analysis of volatile organic compounds by EPA SW-846 Method 8260B. Soil gas samples will be submitted to Eurofins laboratory in Folsom California for analysis of TCE, 1,1-dichloroethene, cis- and trans- 1,2-dichloroethene, and vinyl chloride by EPA Method TO-15 (full scan). Selected ion monitoring will be requested on the outdoor air sample in order to

increase the sensitivity. The minimum sensitivity requirements for samples submitted to the laboratory analysis are provided in Table 2.

Table 2. Minimum Sensitivity Requirements for Lab Analysis

Compound	Groundwater, ug/l	Soil Gas, ug/m^3
cis-2,1-Dichloroethene	5	10
Trichloroethene (TCE)	5	10
1,1-Dichloroethene	5	10
trans-1,2-Dichloroethene	5	10
Vinyl chloride	5	10

4.5 Number of Samples, and Container and Preservation

One or two groundwater samples and a duplicate will be collected. Approximately 10 soil gas samples will be collected including an equipment blank and field duplicate. Groundwater will be collected with no headspace into 40-ml amber vials with Teflon lined caps, preserved with HCL to a pH below 2 and stored on ice until submission to the laboratory. Groundwater sample holding time limit is 14 days from collection. Soil gas samples will be collected into 1-liter evacuated Summa canisters which require no preservation and also have a holding time limit of 14 days.

4.6 Chain-of-Custody

All samples submitted for laboratory analysis will be entered onto chain-of-custody forms which will accompany samples shipped to the laboratory (Appendix C).

5.0 Quality Control (QC)

Field Sampling quality control measures described in SOPs ESP_CAS-2090, MDNR-ESP-210 and ESP-ESP-213 will be followed during sample collection as further described below.

5.1 Field Decontamination

Clean disposable latex gloves will be worn by sampling personnel and clean or field decontaminated equipment will be utilized for each sample location to minimize the possibility of cross-contamination. The following procedure will be used to decontaminate Geoprobe boring rods between sampling locations.

- Brushing with stiff-bristle nylon brush to remove visible soil debris;
- Cleaning with Simple Green® or Liquinox solution detergent and further brushing;
- Rinsing with DI water; or alternatively due to large volume required, the Geoprobe tooling will be rinsed with plain potable water
- Wiping dry with clean paper towels

5.2 Quality Assurance/Quality Control (QA/QC) Samples

The following samples will be collected as part of the quality control/quality assurance procedures for the investigation.

5.2.1 Trip Blank

A trip blank will be used to estimate bias due to cross-contamination during sample storage and transport. One set of water trip blanks will be transported to the site and returned for VOC analysis.

5.2.2 Collocated Samples

At one deep soil gas sampling location, a collocated soil gas sample will be collected. A second boring will be advanced to the same depth approximately 3 feet apart and soil gas collected into a separate 1L Summa canister.

5.2.3 Laboratory QC

Laboratory precision and accuracy will be assessed as described in the QAPP for Pre-Remedial/Pre-Removal and Targeted Brownfields Site Assessments Revision 8, December 29, 2017 and ongoing.

6.0 Investigation Derived Wastes (IDW) Plan

Efforts will be made to minimize IDW generation. IDW may include groundwater, equipment decontamination fluids, disposable sampling equipment, and disposable personal protective equipment (PPE).

Field personnel will containerize soil cores and transport them to the ESP laboratory for proper disposal. Disposable PPE and disposable sampling equipment will be handled as solid waste, containerized, and properly disposed. Groundwater purge water and wash and rinse waters generated during equipment decontamination will be discharged to the ground surface.

7.0 Site Safety

A safety briefing will be held on-site prior to initiating field activities and field personnel will be required to read and sign the site-specific health and safety plan included as Appendix B.

8.0 Reporting

ESP will prepare a Sampling Report including a copy of the field notes, chain of custodies and laboratory result sheets. SAU will prepare a Site Inspection Investigation Report.

REFERENCES

MDNR, 2017 — Missouri Department of Natural Resources, QAPP for Pre-Remedial, Pre-Removal and Targeted Brownfields Assessments, December 29, 2017.

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Wilder, 1999 — Wilder, Valerie, Missouri Department of Natural Resources, Combined Preliminary Assessment/Site Inspection Report, Former Hulett Lagoon Site, Camdenton, Missouri, March 30, 1999.

SIGNATURES

Prepared by:

Michael Stroh
Environmental Scientist
Site Assessment Unit
Hazardous Waste Program

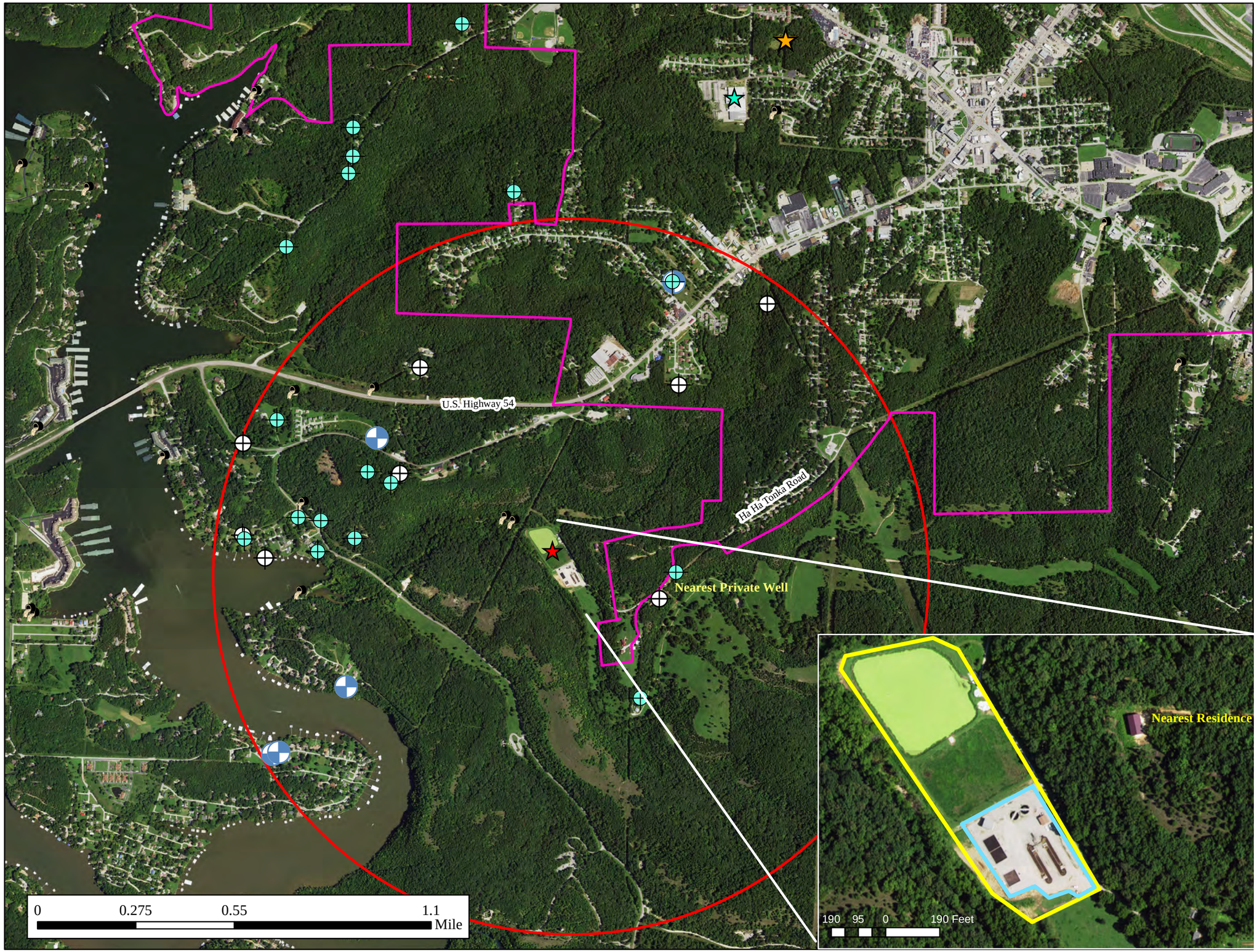
Sean Counihan
Environmental Specialist
Field Services Unit
Environmental Services Program

Approved by:

Martin Kator
Unit Chief
Site Assessment Unit
Hazardous Waste Program

Date: December 17, 2018

Figure 1: Site Location Map
Camdenton Treatment
Plant Lagoon
Camden County, Missouri



Legend

- Public Wells Within 1 Mile of Site
- Private Wells Sampled in 2017 (Dawson #2 Site)
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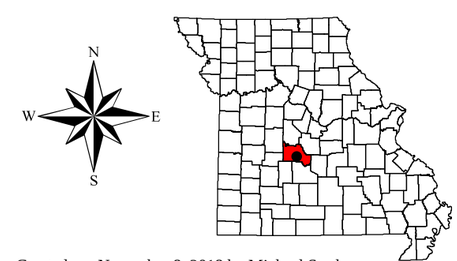


Created on: November 8, 2018 by Michael Stroh.
This map is located at M/Superfund/Camdenton Treatment Plant Lagoon/Figure1 Site Location Map
Base Map: National Agriculture Imagery Program (NAIP) ortho photography. Flight Date: 2014
Data Sources: US Census 2010;
Missouri Department of Transportation

MISSOURI DEPARTMENT OF NATURAL RESOURCES

Figure 2: Proposed Sampling Locations
Camdenton Treatment Plant Lagoon
Camden County, Missouri

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL SERVICES PROGRAM

SITE HEALTH AND SAFETY PLAN

1.0 INTRODUCTION

This plan has been prepared for implementation by DNR employees, using operating procedures for which they are specifically trained. Any use of the plan by other agencies, organizations, or private individuals is at their own risk.

2.0 KEY PERSONNEL

MDNR OSC: Sean Counihan SAFETY OFFICER: Sean Counihan

OTHER MDNR PERSONNEL/TITLE:

Ken Hannon, Environmental Specialist; Ethan Musick, Environmental Specialist

Caleb Troutt, Environmental Specialist

Andy Stivers, Environmental Specialist

Michael Stroh, Environmental Specialist

3.0 SITE INFORMATION

Site name Camdenton Treatment Plant Lagoon site County/City: Camden/Camdenton

Sampling date: December 19, 2018 Site Description: The CTPL site is a former city of Camdenton WWTF lagoon and received waste water from the facility at 221 Sunset Drive that had documented releases of TCE and contamination to its wastewater/effluent. The wastewater from the facility was rerouted to this site for a short time and it is proposed that this former lagoon received waste water that was contaminated with TCE.

3.1 Overall Incident Risk/Hazard Analysis

Chemical:	____ Serious	____ Moderate	X Low	____ Unknown
Physical:	____ Serious	____ Moderate	X Low	____ Unknown

3.2 Contaminant(s) of Concern: TCE and its breakdown chemicals.

3.2.1 Physical State: X Liquid X Solid ____ Sludge X Gas/Vapor

Chemical Characteristics: (check all that apply)

X a. carcinogen	____ b. biological	____ c. corrosive	X d. combustible
____ e. explosive	X f. flammable	X g. volatile	X h. poison
____ i. radioactive	____ j. reactive	____ k. other: ____	

3.2.2 Physical Hazards: (check all that apply)

a. __X__overhead _____b. below grade _____c. confined space*X__X__d. noise
e. __X__splash _____f. fire/burn _____g. puncture __X__h. heat stress
i. __X__cut __X__j. slip/trip/fall _____k. cold stress _____l. electrical
m. __X__mechanical/heavy equipment _____n. other:_____

* The need for confined space entry by ESP personnel shall be evaluated on a site-by-site basis. A confined space entry permit must be signed by the appropriate Unit or Section Chief prior to ESP employees entering a confined space (29 CFR 1910.146). Confined space entry shall be screened in at least Level B prior to downgrade. **Adequate resources must be available and specific planning and tasks determined before confined space entry is initiated.**

3.3 Task-Specific Risk Analysis (attach additional sheets as necessary)

Task Description	Chemical Hazards	Physical Hazards	Level of Protection
Groundwater/soil boring Sampling	a d f g h	a d e h i j m	D
Private well & spring sampling	a d f g h	a h j	D
Air/subslab Sampling	a d f g h	a d h i j m	D

4.0 MEDICAL SURVEILLANCE AND PERSONNEL TRAINING REQUIREMENTS

All ESP field personnel participate in a medical monitoring program and are trained at least to the level of "Hazardous Substance Emergency Response-Technician" as required and specified in the department's written health and safety program located in Section 2 of the MDNR-Hazardous Substances Emergency Response Plan (HSERP). The written policy satisfies requirements set out in 29 CFR 1910.120. MDNR ESP's respiratory protection program meets the requirements of 29 CFR 1910.134.

ESP personnel will ascertain as much information as possible regarding health and safety issues associated with the site prior to initial entry. Information shall include chemical and physical hazards as listed above, types and amounts of materials involved, and citizens/areas threatened by the incident.

5.0 PERSONAL PROTECTIVE EQUIPMENT

ESP shall utilize the Protection Level categories defined in 29 CFR 1910.120, Appendix B, and known as Levels A, B, C, and D. Refer to Section 2 of the MDNR-HSERP for definitions of Protection Levels. ESP personnel shall inspect APRs and SCBAs at least monthly and maintain a record of such to ensure equipment is functional.

Levels of protection shall be reassessed and upgraded as conditions change and information is updated to comply with worker safety while performing site activities.

Action Levels for evacuation of work zone pending reassessment of conditions:

Level D: O_2 < 19.5% or > 25%; explosive atmosphere > 10% LEL; organic vapors > background levels; other_____.

Level C: O_2 < 19.5% or > 25%; explosive atmosphere > 20% LEL; organic vapors (in breathing zone) > 5 m.u.; other _____.

Level B: O_2 Explosive atmosphere > 20% LEL; unknown organic vapors (in breathing zone) > 500 m.u.; other_____.

Level A: ESP personnel shall evaluate the need for entry on a site-specific basis and may utilize its emergency response contractor for Level A situations which may arise.

6.0 FREQUENCY AND TYPE OF AIR MONITORING/SAMPLING

Instrument	Contaminant of Concern	Sample Location (Area/Source)	Frequency	Odor Threshold/ Description
N/A				

7.0 SITE CONTROL MEASURES

7.1 The "Buddy-System": ESP personnel performing any work activities within the exclusion zone shall employ the "buddy-system" at all times, as required and defined in Section 2 of the MDNR-HSERP. The "buddy-system" may not be required while an ESP staff member is observing or providing oversight of cleanup activities performed by a contractor or responsible party.

7.2 Safe work Practices: Refer to Section 2 of the MDNR-HSERP for written safety practices to be followed at all times by ESP personnel while on-site at an incident.

7.3 Site Communications: The use of two-way radios or establishment of hand signals for communications shall be determined prior to entering the work zone and followed by ESP personnel.

7.4 Radiation Safety: Due to the possibility of an unknown radiation hazard being present on a site, ESP personnel shall be required to wear radiation indicator badges (TLD badges) while on-site.

7.5 Work Zones: ESP personnel shall ensure work zones are established and be aware of their locations.

8.0 DECONTAMINATION PROCEDURE/SOLUTIONS:

Personnel: Gloves and clothing will be placed in a garbage bag and returned to Jefferson City for proper disposal.

Equipment: Returned to Jefferson City for proper decontamination or field decontaminated.

Instruments: Returned to Jefferson City for proper decontamination or disposed of back in Jefferson City.

Decontamination fluids/materials may be to be containerized for proper disposal or discharged to the ground.

9.0 EMERGENCY INFORMATION:

In the event of an emergency, notify the MDNR Environmental Emergency Response Office at 573/634-2436. The Duty Officer will make the appropriate notifications.

10.0 ADDITIONAL EMERGENCY INFORMATION/NUMBERS:

Hospital: Lake Regional Hospital, 54 Hospital Drive, Osage Beach, MO 573-348-8000

Location/Specific directions from Site: See attached map

	Name/Location	Telephone Number
Ambulance:	Camden Ambulance District	911
Police/Sheriff:	Camdenton PoliceDepartment	911
Fire:	Camdenton Fire Department	911

Poision Control:

Cellular Telephones/Other:

1) Central Accident Reporting Office- WORK RELATED INJURY 1-800-624-2354

This number is to be called in the event of a NON LIFE THREATENING injury PROIR to seeking medical care.

11.0 SIGNATURES

ESP personnel shall certify they have read the plan and addressed any questions regarding worker health and safety by signing and dating below followed by printing their name and title.

Signature	Printed Name/Title	Date	TLD Badge

Site Inspection (SI)

Sampling and Analysis Report

Camdenton Treatment Plant Lagoon Site

Camdenton, Camden County, Missouri

Prepared By:

Missouri Department of Natural Resources
Division of Environmental Quality
Environmental Services Program

Prepared For:

Missouri Department of Natural Resources
Division of Environmental Quality
Hazardous Waste Program

Table of Contents

Appendices

1.0 Introduction

As authorized under the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986, the Missouri Department of Natural Resources (Department), Hazardous Waste Program (HWP), Site Assessment Unit (SAU) with assistance from the Field Services Unit (FSU) of the Environmental Services Program (ESP) conducted a Site Inspection (SI) at the Camdenton Treatment Plant Lagoon (CTPL) site. The CTPL site is the former location of a domestic wastewater treatment lagoon in Camdenton, Missouri.

The objective of the investigation was to assess potential threats to human health and the environment at the site and if necessary, gather data for the preparation of a preliminary site score under the Hazard Ranking System (HRS). The scope of the SI included sampling of soil gas and shallow groundwater.

2.0 Site Information

2.1 Location

The CTPL site, also known as the C.P. White Lagoon, is the location of former eight-acre, two-cell wastewater treatment lagoon built in the early 1960s and operated by the city of Camdenton. The address is 1164 Ha Ha Tonka Road in Camdenton, and the geographical coordinates are 37.990862 decimal degrees latitude, -97.766473 decimal degrees longitude. See Appendix A for the Site Location Map. Following closure, a portion of the lagoon was redeveloped as the location of the Camdenton's current wastewater treatment plant (WWTP).

The treatment plant includes an 800 ft^2 office building with three full time employees. There are two residences within 0.25 miles of the CTPL; the nearest one is 350 feet to the east on a ridge above the valley.

2.2 Site History/Operation

The CTPL was one of several individual treatment lagoons the city maintained prior to opening a centralized WWTP in June 1989. The WWTP is located in the same area as the CTPL. The lagoon was one of several operated by the city to receive and treat sources of wastewater within the City of Camdenton prior to the opening of the WWTP in 1989. One of the other city lagoons, City Lagoon #3 (also known as the Hulett Lagoon), received a mixture of domestic wastewater and effluent from a refrigeration coil manufacturing facility located at 221 Sunset Drive, located approximately 600 feet southwest of Lagoon #3. That facility used TCE as a degreasing agent, and releases of TCE from the facility to Lagoon #3 in the plant's wastewater discharge resulted in contamination of the sludge, surrounding soils and groundwater beneath the lagoon. Following the initial discovery by the City of Camdenton of TCE contamination in Lagoon #3 in 1984, the city completed a cleanup at Lagoon #3 in 1989 involving the removal of 2,395 cubic yards of contaminated sludge and soil. The lagoon was subsequently closed by filling with clean soil.

It was recommended by a public citizen concern group to investigate the CTPL site. The Department initiated and completed a Pre-CERCLA Screening investigation for the CTPL site in 2018. Historical records indicate that following disconnection of City Lagoon #3 from the Sunset Drive facility in December 1987, the facility's wastewater was rerouted to the CTPL. As noted, the CTPL was closed on June 8, 1989, when the WWTP became operational. Over an 18 month period the CTPL received industrial wastewater effluent from the 221 Sunset Drive facility. Available discharge volume and effluent TCE concentration data were used to estimate the mass of TCE that may have been released to the CTPL in wastewater effluent from the

Sunset Drive facility (38 lbs) over this 18-month period. Based on the potential release of hazardous substances to the CTPL, the Department recommended further CERCLA assessment.

3.0 Data Quality Objectives

To help ensure precise, accurate, representative, complete, and comparable data, all field work and analyses was conducted in accordance with the Quality Assurance Project Plan (QAPP) for Pre-Remedial/Pre-Removal Site Assessments, Revision 8, December 29, 2017, and ongoing.

4.0 Field Activities

4.1 Sample Collection

Sampling activities included the collection of soil cores, shallow groundwater and soil gas samples. Locational information was collected for each sample using a Trimble GeoExplorer GPS and the data was differentially post-processed.

4.1.1 Soil Cores

On the west side of the office building, a two-inch diameter soil boring was conducted, to collect soil cores, by direct push method using a truck mounted Geoprobe hydraulic soil probe. Cores were collected in PVC Macro-Core liners at five foot intervals from the surface to 20 feet in depth. The cores were screened for volatile organic compounds using a photoionization detector (PID) at one foot intervals. The liner was then cut open and observations of the soil core were logged on a soil boring log sheet. No samples were collected for lab analysis from the soil cores.

4.1.2 Groundwater

A ground water sample was collected from the boring conducted on the west side of the building. Ground water was encountered at approximately 11 feet below the ground surface (bgs) with a total depth of 20 feet bgs. A five foot section of slotted Schedule 40 PVC well screen was lowered into the open boring and connected with solid sections of pipe up to the ground surface.

A water level indicator was used to record the depth to water below ground surface. Disposable ¼ inch polyethylene tubing was lowered into the well screen and the well was purged using a peristaltic pump. Low flow purging techniques were used with a flow less than 500 ml/min. Water quality parameters (temperature, pH, and specific conductivity) were monitored during purging. Readings were collected every three minutes and once field measurements were stabilized (pH within 0.2 units, temperature and specific conductivity within +/- 10%), a sample was collected for laboratory analysis. Only one ground water sample was collected for comparison to soil gas data. Following sample collection, the boring was plugged with bentonite and hydrated. The boring and groundwater sample were adjacent to soil gas sampling location SG-01 on the west side of the building.

4.1.3 Soil Gas Sampling

After the soil core was logged and the ground water sample was collected, soil gas samples were collected from two depths at four locations around the perimeter (one on each side) of the WWTP office building. Soil gas samples were collected using the Geoprobe by direct push and a post-run tubing (PRT) system. Based on the depth to water, at approximately 11 feet bgs, it was decided that the shallow soil gas samples would be collected at a five feet bgs, and the deep soils gas sample would be collected at 10 feet bgs. The shallow and deep sample locations were independent of one another and approximately three feet apart. The direct push rig was used to advance rods equipped with an expendable drive point to the target depth. The tip was released and the rod string pulled back to expose a 1 foot interval of soil. Post-run tubing equipped with a threaded adaptor was inserted through the rods and screwed into the expendable point holder at the end of the rod string forming a gas-tight seal. Hydrated bentonite was placed around the rod at the ground surface to prevent intrusion of atmospheric air into the rod string. The volume of the tubing was calculated based on tube diameter and length, and a minimum of three volumes were evacuated to purge the sampling point using a 100 ml plastic air tight syringe attached to the tubing with a three way valve.

Prior to collection of each soil gas sample, a leak check was conducted. A shroud was placed on the surface around the rod and bentonite seal and ultra-high purity helium was introduced into the shroud to a concentration of 60% or greater. The leak check was performed by directly inserting a portable helium detector into the tubing to analyze the system for helium. A result of less than 1% of the initial helium concentration in the shroud would indicate a sufficient seal against intrusion of atmospheric air into the sample. All shallow and deep sampling systems passed their respective leak checks without issue. Following a successful leak check, a 1-liter evacuated SUMMA canister was attached to the post-run tubing and a soil gas sample was collected at a rate of approximately 100 ml/min. Immediately following sample collection, the rods were retracted, the boring plugged with bentonite, hydrated, and the surface was restored to the extent practical.

4.1.4 Ambient Air Sample

One ambient air sample was collected in the vicinity of SG-01 on the west side of the building. The sample was collected by opening a 1 liter SUMMA canister near the soil gas collection site. The SUMMA had the same 100ml/min flow controller as the soil gas samples.

4.2 Number of Samples and Sample Analysis

One groundwater sample was submitted to the Department's analytical laboratory in Jefferson City for analysis of volatile organic compounds by EPA SW-846 Method 8260B. Eight soil gas samples and one ambient air sample were submitted to Eurofins laboratory in Folsom California for TO-15 analysis.

4.3 Chain-of-Custody

All samples submitted for laboratory analysis were entered onto chain-of-custody forms which accompanied samples shipped to the laboratory.

4.4 Field Decontamination

Clean disposable latex gloves were worn by sampling personnel and clean or field decontaminated equipment was utilized for each sample location to minimize the possibility of cross-contamination. The following procedures were used to decontaminate Geoprobe boring rods between sampling locations.

- Brushing with stiff-bristle nylon brush to remove visible soil debris;
- Cleaning with Simple Green or Liquinox solution detergent and further brushing;
- Rinsing with DI water; or alternatively due to large volume required, the Geoprobe tooling was rinsed with plain potable water;
- Wiping dry with clean paper towels

5.0 Quality Assurance/Quality Control (QA/QC) Samples

The following samples were collected as part of the quality control/quality assurance procedures for the investigation.

5.1 Trip Blank

A trip blank was used to estimate bias due to cross-contamination during sample storage and transport. One set of water trip blanks was transported to the site and returned for volatile organics analysis.

5.2 Duplicate

A duplicate groundwater sample was collected from the soil boring conducted on the west side of the building. The duplicate sample was collected in the same manner, with the same equipment and at the same time as the true groundwater sample. The duplicate sample was assigned a unique sample number, and entered onto the chain-of-custody form as "blind duplicate," and was submitted for the same analytes as the true samples.

6.0 Investigation Derived Wastes (IDW) Plan

Efforts were made to minimize IDW generation. IDW included groundwater, equipment decontamination fluids, disposable sampling equipment, and disposable personal protective equipment (PPE).

Field personnel containerized the soil cores and transported them to the ESP laboratory for proper disposal. Disposable PPE and disposable sampling equipment was handled as solid waste, containerized, and properly disposed. Groundwater purge water and wash and rinse waters generated during equipment decontamination were discharged to the ground surface.

7.0 Site Safety

A safety briefing was held on-site prior to initiating field activities and field personnel were required to read and sign the site-specific health and safety plan.

8.0 Reporting

Please refer to Appendix D for analytical results of samples collected.

Table 1

CTPL Site, Camden County, Missouri

Sample Number	Date Collected	Time Collected (start/stop)	Location Collected/Description
184799	12/18/17	1500	Trip Blank
184800	12/19/18	1005	GW-01, groundwater collected from soil boring on west side of building
184801	12/19/18	N/A	Blind Duplicate of 184800
184802	12/19/18	1055	SG-01-05, soil gas sample collected on the west side of the building at the five foot depth
184803	12/19/18	1202	SG-01-10, soil gas sample collected on the west side of the building at the ten foot depth
184804	12/19/18	1235	SG-02-05, soil gas sample collected on the south side of the building at the five foot depth
184805	12/19/18	1220	SG-02-10, soil gas sample collected on the south side of the building at the ten foot depth
184806	12/19/18	1309	SG-03-05, soil gas sample collected on the east side of the building at the five foot depth
184807	12/19/18	1312	SG-03-10, soil gas sample collected on the east side of the building at the ten foot depth
184808	12/19/18	1349	SG-04-05, soil gas sample collected on the north side of the building at the five foot depth
184809	12/19/18	1348	SG-04-10, soil gas sample collected on the north side of the building at the ten foot depth
184810	12/19/18	1417	Ambient air sample

Prepared by:

Sean Counihan
Environmental Specialist
Field Services Unit
Environmental Services Program

APPROVED
By Eric Sappington at 10:13 am, Jan 24, 2019

Approved by:

Eric Sappington
Unit Chief
Field Services Section
Environmental Services Program

ES:sc

c: Michael Stroh, Environmental Scientist, HWP

Appendix A

Site Location Maps

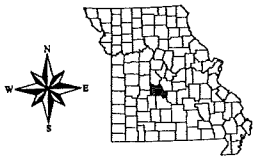
CTPL Site

Camdenton, Missouri

Site Location Map
Camdenton Treatment
Plant Lagoon
Camden County, Missouri

Legend

- Public Wells Within 1 Mile of Site
- Private Wells Within 1 Mile of Site
- NPDES Outfalls
- Camdenton Treatment Plant Lagoon
- City Lagoon #3
- 221 Sunset Drive Facility
- Former CTPL Lagoon Boundary
- Camdenton WWTP
- Camdenton Municipal Boundary



Created on: November 8, 2018 by Michael Stroh.
This map is located at M:\Superfund\Camdenton Treatment Plant Lagoon\Figure1 Site Location Map
Base Map: National Agriculture Imagery Program (NAIP) ortho photography. Flight Date: 2014
Data Sources: US Census 2010;
Missouri Department of Transportation

Although data sets used to create this map have been compiled by the Missouri Department of Natural Resources, no warranty, expressed or implied, is made by the department as to the accuracy of the data and related materials. The act of distribution shall not constitute any such warranty, and no responsibility is assumed by the department in the use of these data or related materials.

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

General Location of Soil Borings
Camdenton Treatment Plant Lagoon
Camden County, Missouri

Appendix B

Chain of Custody

CTPL Site

Camdenton, Missouri

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FIELD SHEET AND CHAIN-OF-CUSTODY RECORD

Description of Delivery
- [ ] Tape sealed and initialed
- [ ] Shipped
- [x] Hand Delivered

Total No. Of Containers: 6
Carrier:
By:

Collector's Name: Sean Counihan
(Please Print)

Affiliation: [ ] KCRO [ ] NLRO [ ] SERO [ ] SLRO [ ] SWRO [ ] WPP [ ] MGS [ ] HWP [x] ESP [ ] MoDOT [ ] MDC [ ] DHSS [ ] Other:

LAB USE ONLY!
Laboratory ID: 181220003
Location: A-14

Sample Number	Sample Collected	Analyses Requested	Disinfect. Type (check one)	Field Parameters (include units)	Matrix (check one)	Container Type	Preservative Type	Number of Containers
184799 (Sample A) / For Lab Use Only: A037550	Date: 12/18/2018 Time: 1500	VOA	[x] None [ ] Chlorine [ ] UV [ ] Ozone [ ] Other:	D.O. Flow pH Cond. Temp. Other:	[x] Water [ ] Soil [ ] Organic [ ] Sludge [ ] Other:	40mlag	HCl	2
184800 (Sample B) / For Lab Use Only: A037551	Date: 12/19/2018 Time: 1005	VOA	[x] None [ ] Chlorine [ ] UV [ ] Ozone [ ] Other:	D.O. Flow pH 7.1 Cond. 511µs Temp. 16.0°C Other:	[x] Water [ ] Soil [ ] Organic [ ] Sludge [ ] Other:	40mlag	HCl	2
184801 (Sample C) / For Lab Use Only: A037552	Date: 12/19/2018 Time: 0000	VOA	[x] None [ ] Chlorine [ ] UV [ ] Ozone [ ] Other:	D.O. Flow pH Cond. Temp. Other:	[x] Water [ ] Soil [ ] Organic [ ] Sludge [ ] Other:	40mlag	HCl	2
(Sample D) / For Lab Use Only:	Date: Time:		[ ] None [ ] Chlorine [ ] UV [ ] Ozone [ ] Other:	D.O. Flow pH Cond. Temp. Other:	[ ] Water [ ] Soil [ ] Organic [ ] Sludge [ ] Other:			

Relinquished By:	Received By:	Date:	Time:
[signature]	Cassy Allee	12/20/18	0905
Relinquished By:	Received By:	Date:	Time:
Relinquished By:	Received By:	Date:	Time:

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FIELD SHEET AND CHAIN-OF-CUSTODY RECORD

Sample A

LDPR: FEPA3	Job Code: NJ18CTPL	Sample Reference ID:	
Facility ID:	Site/Study Name: Camdeton Treatment Plant Lagoon	County: Camden	
Sample Comment (where and how the sample was collected): Sample Number 184799 Trip Blank	☑ Grab ☐ Composite ☐ Modified ☐ Other:		
GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one) ☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☑ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☐ Air
- ☐ Container
- ☐ QA/QC
- ☑ Groundwater
- ☐ Organic
- ☐ Sediment
- ☐ Sludge
- ☐ Drinking Water Supply
- ☐ Soil
- ☐ Spill
- ☐ Wipes
- ☐ Storm Water
- ☐ Surface Water
- ☐ Discharge

Sample B

LDPR: FEPA3	Job Code: NJ18CTPL	Sample Reference ID:	
Facility ID:	Site/Study Name: Camdeton Treatment Plant Lagoon	County: Camden	
Sample Comment (where and how the sample was collected): Sample Number 184800 GW-01 west side of building	☑ Grab ☐ Composite ☐ Modified ☐ Other:		
GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one) ☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☑ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☐ Air
- ☐ Container
- ☐ QA/QC
- ☑ Groundwater
- ☐ Organic
- ☐ Sediment
- ☐ Sludge
- ☐ Drinking Water Supply
- ☐ Soil
- ☐ Spill
- ☐ Wipes
- ☐ Storm Water
- ☐ Surface Water
- ☐ Discharge

Sample C

LDPR: FEPA3	Job Code: NJ18CTPL	Sample Reference ID:	
Facility ID:	Site/Study Name: Camdeton Treatment Plant Lagoon	County: Camden	
Sample Comment (where and how the sample was collected): Sample Number 184801 Blind Duplicate	☑ Grab ☐ Composite ☐ Modified ☐ Other:		
GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one) ☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☑ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☐ Air
- ☐ Container
- ☐ QA/QC
- ☑ Groundwater
- ☐ Organic
- ☐ Sediment
- ☐ Sludge
- ☐ Drinking Water Supply
- ☐ Soil
- ☐ Spill
- ☐ Wipes
- ☐ Storm Water
- ☐ Surface Water
- ☐ Discharge

Sample D

LDPR: FEPA3	Job Code: NJ18CTPL	Sample Reference ID:	
Facility ID:	Site/Study Name: Camdeton Treatment Plant Lagoon	County: Camden	
Sample Comment (where and how the sample was collected):	☐ Grab ☐ Composite ☐ Modified ☐ Other:		
GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one) ☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☐ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☐ Air
- ☐ Container
- ☐ QA/QC
- ☐ Groundwater
- ☐ Organic
- ☐ Sediment
- ☐ Sludge
- ☐ Drinking Water Supply
- ☐ Soil
- ☐ Spill
- ☐ Wipes
- ☐ Storm Water
- ☐ Surface Water
- ☐ Discharge

Remarks:
3°C

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FIELD SHEET AND CHAIN-OF-CUSTODY RECORD

Description of Delivery
- ☐ Tape sealed and initialed
- ☐ Shipped
- ☑ Hand Delivered

Total No. Of Containers: 4
Carrier:
By:

Collector's Name: (Please Print) Sean Counihan

Affiliation: ☐KCRO ☐NERO ☐SERO ☐SLRO ☐SWRO ☐WPP ☐MGS ☐HWP ☑ESP ☐MoDOT ☐MDC ☐DHSS ☐Other:

LAB USE ONLY!
Laboratory ID: #81220053
Location:

Sample Number	Sample Collected	Analyses Requested	Disinfect. Type (check one)	Field Parameters (include units)	Matrix (check one)	Container Type	Preservative Type	Number of Containers
184802 (Sample A) / For Lab Use Only: A037553	Date: 12/19/2018 / Time: 1055	TO-15	☑None ☐Chlorine ☐UV ☐Ozone ☐Other:	D.O. Flow pH Cond. Temp. Other:	☐Water ☐Soil ☐Organic ☐Sludge ☐Other:			
184803 (Sample B) / For Lab Use Only: A037554	Date: 12/19/2018 / Time: 1202	TO-15	☑None ☐Chlorine ☐UV ☐Ozone ☐Other:	D.O. Flow pH Cond. Temp. Other:	☐Water ☐Soil ☐Organic ☐Sludge ☐Other:			
184804 (Sample C) / For Lab Use Only: A037555	Date: 12/19/2018 / Time: 1235	TO-15	☑None ☐Chlorine ☐UV ☐Ozone ☐Other:	D.O. Flow pH Cond. Temp. Other:	☐Water ☐Soil ☐Organic ☐Sludge ☐Other:			
184805 (Sample D) / For Lab Use Only: A037556	Date: 12/19/2018 / Time: 1220	TO-15	☐None ☐Chlorine ☐UV ☐Ozone ☐Other:	D.O. Flow pH Cond. Temp. Other:	☐Water ☐Soil ☐Organic ☐Sludge ☐Other:			

Relinquished By:	Received By:	Date:	Time:
[signature]	Carmy Allee	12/20/18	0905
Relinquished By:	Received By:	Date:	Time:
Relinquished By:	Received By:	Date:	Time:

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FIELD SHEET AND CHAIN-OF-CUSTODY RECORD

Sample A	LDPR: FEPA3	Job Code: NJ18CTPL	Sample Reference ID:
Facility ID:	Site/Study Name: Camdeton Treatment Plant Lagoon	County: Camden	

Sample Comment (where and how the sample was collected): ☑ Grab ☐ Composite ☐ Modified ☐ Other:
Sample Number 184802 SG-01-05 West side of building Can # 3021 Start Pressure = -29.3, End Pressure = -1

GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one)
			☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☑ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☑ Air
- ☐ Container
- ☐ QA/QC
- ☐ Groundwater
- ☐ Organic
- ☐ Sediment
- ☐ Sludge
- ☐ Drinking Water Supply
- ☐ Soil
- ☐ Spill
- ☐ Wipes
- ☐ Storm Water
- ☐ Surface Water
- ☐ Discharge

Sample B	LDPR: FEPA3	Job Code: NJ18CTPL	Sample Reference ID:
Facility ID:	Site/Study Name: Camdeton Treatment Plant Lagoon	County: Camden	

Sample Comment (where and how the sample was collected): ☑ Grab ☐ Composite ☐ Modified ☐ Other:
Sample Number 184803 SG-01-10 west side of building Can # 1L1607 Start Pressure = -28.5, End Pressure = -3

GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one)
			☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☑ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☑ Air
- ☐ Container
- ☐ QA/QC
- ☐ Groundwater
- ☐ Organic
- ☐ Sediment
- ☐ Sludge
- ☐ Drinking Water Supply
- ☐ Soil
- ☐ Spill
- ☐ Wipes
- ☐ Storm Water
- ☐ Surface Water
- ☐ Discharge

Sample C	LDPR: FEPA3	Job Code: NJ18CTPL	Sample Reference ID:
Facility ID:	Site/Study Name: Camdeton Treatment Plant Lagoon	County: Camden	

Sample Comment (where and how the sample was collected): ☑ Grab ☐ Composite ☐ Modified ☐ Other:
Sample Number 184804 SG-02-05 South side of building Can # 1L1792 Start Pressure = -29.8, End Pressure = -2

GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one)
			☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☑ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☑ Air
- ☐ Container
- ☐ QA/QC
- ☐ Groundwater
- ☐ Organic
- ☐ Sediment
- ☐ Sludge
- ☐ Drinking Water Supply
- ☐ Soil
- ☐ Spill
- ☐ Wipes
- ☐ Storm Water
- ☐ Surface Water
- ☐ Discharge

Sample D	LDPR: FEPA3	Job Code: NJ18CTPL	Sample Reference ID:
Facility ID:	Site/Study Name: Camdeton Treatment Plant Lagoon	County: Camden	

Sample Comment (where and how the sample was collected): ☑ Grab ☐ Composite ☐ Modified ☐ Other:
Sample Number 18480S SG-02-10 South side of building Can #1L2991 Start Pressure = -29.2, End Pressure = -2

GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one)
			☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☑ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☑ Air
- ☐ Container
- ☐ QA/QC
- ☐ Groundwater
- ☐ Organic
- ☐ Sediment
- ☐ Sludge
- ☐ Drinking Water Supply
- ☐ Soil
- ☐ Spill
- ☐ Wipes
- ☐ Storm Water
- ☐ Surface Water
- ☐ Discharge

Remarks:

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FIELD SHEET AND CHAIN-OF-CUSTODY RECORD

Description of Delivery
- ☐ Tape sealed and initialed
- ☐ Shipped
- ☑ Hand Delivered

Total No. Of Containers: 4
Carrier:
By:

Collector's Name: (Please Print) Sean Counihan

Affiliation: ☐KCRO ☐NERO ☐SERO ☐SLRO ☐SWRO ☐WPP ☐MGS ☐HWP ☑ESP ☐MoDOT ☐MDC ☐DHSS ☐Other:

LAB USE ONLY!
Laboratory ID: 181220003
Location:

Sample Number	Sample Collected	Analyses Requested	Disinfect. Type (check one)	Field Parameters (include units)	Matrix (check one)	Container Type	Preservative Type	Number of Containers
184806 (Sample A) / For Lab Use Only: AD37557	Date: 12/19/2018 Time: 1309	TO-15	☑None ☐Chlorine ☐UV ☐Ozone ☐Other:	D.O. Flow pH Cond. Temp. Other:	☐Water ☐Soil ☐Organic ☐Sludge ☐Other:			
184807 (Sample B) / For Lab Use Only: AD37558	Date: 12/19/2018 Time: 1312	TO-15	☑None ☐Chlorine ☐UV ☐Ozone ☐Other:	D.O. Flow pH Cond. Temp. Other:	☐Water ☐Soil ☐Organic ☐Sludge ☐Other:			
184808 (Sample E) / For Lab Use Only: AD37559	Date: 12/19/2018 Time: 1349	TO-15	☑None ☐Chlorine ☐UV ☐Ozone ☐Other:	D.O. Flow pH Cond. Temp. Other:	☐Water ☐Soil ☐Organic ☐Sludge ☐Other:			
184809 (Sample D) / For Lab Use Only: AD37560	Date: 12/19/2018 Time: 1348	TO-15	☐None ☐Chlorine ☐UV ☐Ozone ☐Other:	D.O. Flow pH Cond. Temp. Other:	☐Water ☐Soil ☐Organic ☐Sludge ☐Other:			

Relinquished By:	Received By:	Date:	Time:
[signature]	Cassy Allee	12/20/18	0905
Relinquished By:	Received By:	Date:	Time:
Relinquished By:	Received By:	Date:	Time:

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FIELD SHEET AND CHAIN-OF-CUSTODY RECORD

Sample A

LDPR: FEPA3	Job Code: NJ18CTPL	Sample Reference ID:	
Facility ID:	Site/Study Name: Camdeton Treatment Plant Lagoon	County: Camden	

Sample Comment (where and how the sample was collected): ☑ Grab ☐ Composite ☐ Modified ☐ Other:
Sample Number 184806 SG-03-05 East side of building Can # 1L2858 Start Pressure = -29.7, End Pressure = -2

GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one)
			☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☑ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☑ Air
- ☐ Soil
- ☐ Container
- ☐ Spill
- ☐ QA/QC
- ☐ Wipes
- ☐ Groundwater
- ☐ Storm Water
- ☐ Organic
- ☐ Surface Water
- ☐ Sediment
- ☐ Discharge
- ☐ Sludge
- ☐ Drinking Water Supply

Sample B

LDPR: FEPA3	Job Code: NJ18CTPL	Sample Reference ID:	
Facility ID:	Site/Study Name: Camdeton Treatment Plant Lagoon	County: Camden	

Sample Comment (where and how the sample was collected): ☑ Grab ☐ Composite ☐ Modified ☐ Other:
Sample Number 184807 SG-03-10 East side of building Can # 1L2725 Start Pressure = -29.0, End Pressure = -2

GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one)
			☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☑ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☑ Air
- ☐ Soil
- ☐ Container
- ☐ Spill
- ☐ QA/QC
- ☐ Wipes
- ☐ Groundwater
- ☐ Storm Water
- ☐ Organic
- ☐ Surface Water
- ☐ Sediment
- ☐ Discharge
- ☐ Sludge
- ☐ Drinking Water Supply

Sample C

LDPR: FEPA3	Job Code: NJ18CTPL	Sample Reference ID:	
Facility ID:	Site/Study Name: Camdeton Treatment Plant Lagoon	County: Camden	

Sample Comment (where and how the sample was collected): ☑ Grab ☐ Composite ☐ Modified ☐ Other:
Sample Number 184808 SG-04-05 North side of building Can # 1L1641 Start Pressure = -29.3, End Pressure = -3

GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one)
			☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☑ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☑ Air
- ☐ Soil
- ☐ Container
- ☐ Spill
- ☐ QA/QC
- ☐ Wipes
- ☐ Groundwater
- ☐ Storm Water
- ☐ Organic
- ☐ Surface Water
- ☐ Sediment
- ☐ Discharge
- ☐ Sludge
- ☐ Drinking Water Supply

Sample D

LDPR: FEPA3	Job Code: NJ18CTPL	Sample Reference ID:	
Facility ID:	Site/Study Name: Camdeton Treatment Plant Lagoon	County: Camden	

Sample Comment (where and how the sample was collected): ☑ Grab ☐ Composite ☐ Modified ☐ Other:
Sample Number 184809 SG-04-10 North side of building Can # 3014 Start Pressure = -29.9, End Pressure = -3

GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one)
			☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☑ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☑ Air
- ☐ Soil
- ☐ Container
- ☐ Spill
- ☐ QA/QC
- ☐ Wipes
- ☐ Groundwater
- ☐ Storm Water
- ☐ Organic
- ☐ Surface Water
- ☐ Sediment
- ☐ Discharge
- ☐ Sludge
- ☐ Drinking Water Supply

Remarks:

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FIELD SHEET AND CHAIN-OF-CUSTODY RECORD

Description of Delivery
- [ ] Tape sealed and initialed
- [ ] Shipped
- [x] Hand Delivered

Total No. Of Containers: 1
Carrier:
By:

Collector's Name: (Please Print) Sean Counihan

Affiliation: [ ] KCRO [ ] NERO [ ] SERO [ ] SLRO [ ] SWRO [ ] WPP [ ] MGS [ ] HWP [x] ESP [ ] MoDOT [ ] MDC [ ] DHSS [ ] Other:

LAB USE ONLY!
Laboratory ID: 181220003
Location:

Sample Number	Sample Collected	Analyses Requested	Disinfect. Type (check one)	Field Parameters (include units)	Matrix (check one)	Container Type	Preservative Type	Number of Containers
184810 ~~184806~~ (Sample A)	Date: 12/19/2018	TO-15 SIM	[x] None [ ] Chlorine [ ] UV [ ] Ozone [ ] Other:	D.O. Flow pH Cond. Temp. Other:	[ ] Water [ ] Soil [ ] Organic [ ] Sludge [ ] Other:			
For Lab Use Only AD37561	Time: 1417							
(Sample B)	Date:		[x] None [ ] Chlorine [ ] UV [ ] Ozone [ ] Other:	D.O. Flow pH Cond. Temp. Other:	[ ] Water [ ] Soil [ ] Organic [ ] Sludge [ ] Other:			
For Lab Use Only	Time:							
(Sample C)	Date:		[x] None [ ] Chlorine [ ] UV [ ] Ozone [ ] Other:	D.O. Flow pH Cond. Temp. Other:	[ ] Water [ ] Soil [ ] Organic [ ] Sludge [ ] Other:			
For Lab Use Only	Time:							
(Sample D)	Date:		[ ] None [ ] Chlorine [ ] UV [ ] Ozone [ ] Other:	D.O. Flow pH Cond. Temp. Other:	[ ] Water [ ] Soil [ ] Organic [ ] Sludge [ ] Other:			
For Lab Use Only	Time:							

Relinquished By:	Received By:	Date:	Time:
[signature]	Cassy Allee	12/20/18	0905
Relinquished By:	Received By:	Date:	Time:
Relinquished By:	Received By:	Date:	Time:

AF 1-14-19

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FIELD SHEET AND CHAIN-OF-CUSTODY RECORD

Sample A

LDPR: FEPA3 | Job Code: NJ18CTPL | Sample Reference ID:

Facility ID: | Site/Study Name: Camdeton Treatment Plant Lagoon | County: Camden

Sample Comment (where and how the sample was collected): ☑ Grab ☐ Composite ☐ Modified ☐ Other:
Sample Number 184810 Ambient Air Can # 1L2618 Start Pressure = -29.8, End Pressure = -2

GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one)
			☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☑ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☑ Air
- ☐ Container
- ☐ QA/QC
- ☐ Groundwater
- ☐ Organic
- ☐ Sediment
- ☐ Sludge
- ☐ Drinking Water Supply
- ☐ Soil
- ☐ Spill
- ☐ Wipes
- ☐ Storm Water
- ☐ Surface Water
- ☐ Discharge

Sample B

LDPR: | Job Code: | Sample Reference ID:

Facility ID: | Site/Study Name: | County:

Sample Comment (where and how the sample was collected): ☑ Grab ☐ Composite ☐ Modified ☐ Other:

GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one)
			☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☑ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☑ Air
- ☐ Container
- ☐ QA/QC
- ☐ Groundwater
- ☐ Organic
- ☐ Sediment
- ☐ Sludge
- ☐ Drinking Water Supply
- ☐ Soil
- ☐ Spill
- ☐ Wipes
- ☐ Storm Water
- ☐ Surface Water
- ☐ Discharge

Sample C

LDPR: FEPA3 | Job Code: | Sample Reference ID:

Facility ID: | Site/Study Name: | County:

Sample Comment (where and how the sample was collected): ☑ Grab ☐ Composite ☐ Modified ☐ Other:

GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one)
			☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☑ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☑ Air
- ☐ Container
- ☐ QA/QC
- ☐ Groundwater
- ☐ Organic
- ☐ Sediment
- ☐ Sludge
- ☐ Drinking Water Supply
- ☐ Soil
- ☐ Spill
- ☐ Wipes
- ☐ Storm Water
- ☐ Surface Water
- ☐ Discharge

Sample D

LDPR: | Job Code: | Sample Reference ID:

Facility ID: | Site/Study Name: | County:

Sample Comment (where and how the sample was collected): ☑ Grab ☐ Composite ☐ Modified ☐ Other:

GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one)
			☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☑ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☑ Air
- ☐ Container
- ☐ QA/QC
- ☐ Groundwater
- ☐ Organic
- ☐ Sediment
- ☐ Sludge
- ☐ Drinking Water Supply
- ☐ Soil
- ☐ Spill
- ☐ Wipes
- ☐ Storm Water
- ☐ Surface Water
- ☐ Discharge

Remarks:

Appendix C

Field Notes

CTPL Site

Camdenton, Missouri

Camden Treatment Plant
Lagoon site

2/19/18

Trip Blank collected 12/18/18
at 1500 hours
Sample # 184799

YSI Quatro water quality meter
pH at 4 reads 4.05 ✓
pH at 7 reads 7.02 ✓
Cond at 1413 µs reads 1465 µs ✓
ORP at 200mv reads 212 mv ✓

PID Mini Rae 3000
Calibrated 100 ppm ISO

Caleb Trout
Andy Stowers
Ethan Mansfield
Michael Stroh

SB-01 West Side of
building by Door
GW-01 collected from SB-01
Static water at 11.3 ft
total depth is 20 ft
Started gauge at 0957
flow rate = 400 ml/min
1st reading at 1000
Temp = 17.0 C
Cond = 509 ms
pH = 7.12
2nd reading at 1003
Temp = 17.0 C
Cond = 511 ms
pH = 7.10
Sample collected at 1005
Sample # 184800
Blind Duplicate collected
Sample # 184801

SG-01 ~~North~~ ~~[illegible]~~ West Side near Door
-05 Started at 1038
ended at 1055
Can # 3021
Start Pressure -29.3 end pressure -1
Sample # 184802
~~-10 Started at 1043~~

1st attempt - point fell off

SG-01-10
Started at ~~1143~~ 1150
ended ~~at 1130~~ 1202
Can # ~~7L1607~~ ~~27446~~
Start pressure -28.5
end pressure ~~-5.71~~ -3.0
Sample # 184803

SG-02-05
South Side
Start time 1210
end time 1235
Start pressure -29.8
end pressure -2
Can # ~~27403~~ 1L1792
Sample # 184804

SG-02-10 South Side
Start time 1208
end time 220
Start pressure -29.0
end pressure -2
Can # ~~27416~~ 1L2991
Sample # 184805

SG-03-05 East Side
Start time 1258
end time 1309
Start pressure -29.7
end pressure -2
Can # 1L 2858
Sample # 184806

SG-03-10 East Side
Start time 1300
end time 1312
Start pressure -29.0
end pressure -2
Can # ~~1L2858~~ 1L2725
Sample # 184807

SG-04-05 North Side
Start time 1336
end time 1349
Start pressure ~~-29.9~~ -29.3
end pressure -3
Can # ~~3014~~ 1L 1641
Sample # 184808

SG-04-10 North Side
Start time 1333
end time 1348
Start pressure -29.9
end pressure -3
Can # 3014
Sample # 184809

Ambient Air
Start time 1405
end time 1417
Start pressure -29.8
end pressure -2
Can # 1L 2618
Sample # 184810

ST #	SOIL BORING LOG	BORING #
R #	INVESTIGATOR Sean Counihan	DRILLER
SITE NAME CTPL	DRILLING METHOD Direct Push	SAMPLING METHOD Solid Tube
SITE ADDRESS	BOREHOLE DIA 2 inches	SAMPLING INTERVAL 5 ft
DATE OF BORING 12/19/18	TOTAL BORING DEPTH	STATIC WATER LEVEL

LITHOLOGIC DESCRIPTION AND REMARKS

WELL CONST	DEPTH (~Ft.)	COLOR[1)]	TEXTURE[2)]	OBSERVATIONS	PID ppm	SAMPLE I.D.
	0-1	Gray	Rocky Clay		0	
	1-2				0	
	2-3				0	
	3-4	Red	Rock	Chert layer	0	
	4-5	gray	Rocky Clay		0	
	5-6				0	
	6-7		gravel		0	
	7-8				0	
	8-9	white			0	
	9-10				0	
	10-11	Red	gravel Clay		0	
	11-12	white	gravel		–	
	12-13	Red	gravel Clay	Saturated zone	–	
	13-14				–	
	14-15					
	15-16	Red Brown	Clay / gravel		–	
	16-17					
	17-18				–	
	18-19				–	
	19-20				–	
	20-21				–	Stop at 20 feet collected groundwater sample
	21-22				–	
	22-23				–	
	24				–	
	25					
	26					
	27				–	
	28					
	29				–	
	30					

Show for Each hole

1) CL= clay; SLT= silt; SND= sand; LM= loam.

COMMENTS:

Sch. 80 PVC PIEZOMETER SCREEN= ▒ WATER TABLE= ▽

Appendix D

Analytical Results
CTPL Site
Camdenton, Missouri

Missouri Department of Natural Resources
Environmental Services Program
PO Box 176 Jefferson City MO 65102-0176

RESULTS OF SAMPLE ANALYSES

LDPR/Job Code: FEPA3/NJ18CTPL

Program, Contact: HWP Valerie Wilder

Order ID: 181220003

Valerie Wilder
Hazardous Waste Program

Report Date: 1/14/2019

Sample: AD37550

Customer #: 184799

Site: Camdenton Treatment Plant Lagoon

County: Camden

Collect Date: 12/18/2018 3:00:00 PM

Collector: SEAN COUNIHAN

Affiliation: ESP/EER

Comments: Grab: Sample Number 184799. Trip blank.

Project: S

Test	Parameter/Method	Result	Units	Qualifier(s)
VOAs	1,1,1,2-Tetrachloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1,1-Trichloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1,2,2-Tetrachloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1,2-Trichloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1-Dichloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1-Dichloroethene/8260B/624	<1	µg/L	ND
VOAs	1,1-Dichloropropene/8260B/624	<1	µg/L	ND
VOAs	1,2,3-Trichlorobenzene/8260B/624	<5	µg/L	ND
VOAs	1,2,3-Trichloropropane/8260B/624	<2	µg/L	ND
VOAs	1,2,4-Trichlorobenzene/8260B/624	<5	µg/L	ND
VOAs	1,2,4-Trimethylbenzene/8260B/624	<1	µg/L	ND
VOAs	1,2-Dibromo-3-chloropropane/8260B/624	<1	µg/L	ND
VOAs	1,2-Dibromoethane (EDB)/8260B/624	<1	µg/L	ND
VOAs	1,2-Dichlorobenzene/8260B/624	<1	µg/L	ND
VOAs	1,2-Dichloroethane/8260B/624	<1	µg/L	ND
VOAs	1,2-Dichloropropane/8260B/624	<1	µg/L	ND
VOAs	1,3,5-Trimethylbenzene/8260B/624	<1	µg/L	ND
VOAs	1,3-Dichlorobenzene/8260B/624	<1	µg/L	ND
VOAs	1,3-Dichloropropane/8260B/624	<1	µg/L	ND
VOAs	1,4-Dichlorobenzene/8260B/624	<1	µg/L	ND
VOAs	1-Chlorobutane/8260B/624	<1	µg/L	ND
VOAs	2,2-Dichloropropane/8260B/624	<1	µg/L	ND
VOAs	2-Butanone (MEK)/8260B/624	<5	µg/L	29, ND
VOAs	2-Chlorotoluene/8260B/624	<1	µg/L	ND
VOAs	2-Hexanone/8260B/624	<2	µg/L	29, ND
VOAs	2-Nitropropane/8260B/624	<1	µg/L	ND
VOAs	4-Chlorotoluene/8260B/624	<1	µg/L	ND
VOAs	4-Methyl-2-pentanone(MIBK)/8260B/624	<1	µg/L	ND
VOAs	acetone/8260B/624	<20	µg/L	ND
VOAs	Acrylonitrile/8260B/624	<2	µg/L	ND

Sample: AD37550

Customer #: 184799

Site: Camdenton Treatment Plant Lagoon

Collect Date: 12/18/2018 3:00:00 PM **Collector:** SEAN COUNIHAN

County: Camden

Affiliation: ESP/EER

Comments: Grab: Sample Number 184799. Trip blank.

Project: S

VOAs	Allyl Chloride/8260B/624	<1	µg/L	ND
VOAs	Benzene/8260B/624	<1	µg/L	ND
VOAs	Bromobenzene/8260B/624	<1	µg/L	ND
VOAs	Bromochloromethane/8260B/624	<1	µg/L	ND
VOAs	Bromodichloromethane/8260B/624	<1	µg/L	ND
VOAs	Bromoform/8260B/624	<1	µg/L	ND
VOAs	Bromomethane/8260B/624	<5	µg/L	ND
VOAs	carbon disulfide/8260B/624	<1	µg/L	ND
VOAs	Carbon Tetrachloride/8260B/624	<1	µg/L	ND
VOAs	Chloroacetonitrile/8260B/624	<25	µg/L	ND
VOAs	Chlorobenzene/8260B/624	<1	µg/L	ND
VOAs	Chloroethane/8260B/624	<5	µg/L	ND
VOAs	Chloroform/8260B/624	<1	µg/L	ND
VOAs	Chloromethane/8260B/624	<25	µg/L	ND
VOAs	cis-1,2-dichloroethene/8260B/624	<1	µg/L	ND
VOAs	cis-1,3-Dichloropropene/8260B/624	<1	µg/L	ND
VOAs	Dibromochloromethane/8260B/624	<1	µg/L	ND
VOAs	Dibromomethane/8260B/624	<1	µg/L	ND
VOAs	Dichlorodifluoromethane/8260B/624	<1	µg/L	ND
VOAs	Diethyl ether/8260B/624	<20	µg/L	ND
VOAs	Ethylbenzene/8260B/624	<1	µg/L	ND
VOAs	Ethylmethacrylate/8260B/624	<1	µg/L	ND
VOAs	Hexachlorobutadiene/8260B/624	<2	µg/L	ND
VOAs	Hexachloroethane/8260B/624	<1	µg/L	ND
VOAs	Iodomethane/8260B/624	<5	µg/L	29, ND
VOAs	Isopropylbenzene/8260B/624	<1	µg/L	ND
VOAs	m&p-Xylenes/8260B/624	<1	µg/L	ND
VOAs	Methacrylonitrile/8260B/624	<1	µg/L	ND
VOAs	Methyl Acrylate/8260B/624	<10	µg/L	29, ND
VOAs	Methylene chloride/8260B/624	<20	µg/L	ND
VOAs	Methylmethacrylate/8260B/624	<1	µg/L	ND
VOAs	Methyl-t-butyl ether/8260B/624	<1	µg/L	ND
VOAs	Naphthalene/8260B/624	<5	µg/L	ND
VOAs	n-Butylbenzene/8260B/624	<1	µg/L	ND
VOAs	Nitrobenzene/8260B/624	<10	µg/L	ND
VOAs	n-Propylbenzene/8260B/624	<1	µg/L	ND
VOAs	o-Xylene/8260B/624	<1	µg/L	ND
VOAs	Pentachloroethane/8260B/624	<1	µg/L	ND
VOAs	p-isopropyltoluene/8260B/624	<1	µg/L	ND
VOAs	Propionitrile/8260B/624	<20	µg/L	29, ND
VOAs	sec-Butylbenzene/8260B/624	<1	µg/L	ND
VOAs	Styrene/8260B/624	<1	µg/L	ND
VOAs	tert-Butylbenzene/8260B/624	<2	µg/L	ND
VOAs	Tetrachloroethene/8260B/624	<1	µg/L	ND
VOAs	Tetrahydrofuran/8260B/624	<5	µg/L	ND
VOAs	Toluene/8260B/624	<1	µg/L	ND
VOAs	Total Xylenes/8260B/624	<2	µg/L	ND
VOAs	trans-1,2-Dichloroethene/8260B/624	<1	µg/L	ND
VOAs	trans-1,3-Dichloropropene/8260B/624	<1	µg/L	ND
VOAs	trans-1,4-Dichloro-2-butene/8260B/624	<1	µg/L	ND
VOAs	Trichloroethene/8260B/624	<1	µg/L	ND
VOAs	Trichlorofluoromethane/8260B/624	<5	µg/L	ND

Sample: AD37550

Customer #: 184799

Site: Camdenton Treatment Plant Lagoon

County: Camden

Collect Date: 12/18/2018 3:00:00 PM

Collector: SEAN COUNIHAN

Affiliation: ESP/EER

Comments: Grab: Sample Number 184799. Trip blank.

Project: SI

VOAs	Vinyl Chloride/8260B/624	<1	µg/L	ND

Sample: AD37551

Customer #: 184800

Site: Camdenton Treatment Plant Lagoon

Collect Date: 12/19/2018 10:05:00 AM **Collector:** SEAN COUNIHAN

County: Camden

Affiliation: ESP/EER

Comments: Grab: Sample Number 184800. GW-01. West side of building.

Project: SI

Test	Parameter/Method	Result	Units	Qualifier(s)
Field pH	Field pH/EPA 150.1	7.1	pH Units	
Field Specific Conductivity	Field Specific Conductivity/SM 2510	511 uS/cm		
Field Temperature	Field Temperature/EPA 170.1	16.0 C		
VOAs	1,1,1,2-Tetrachloroethane/8260B/624	<10.0	µg/L	09, ND
VOAs	1,1,1-Trichloroethane/8260B/624	<10.0	µg/L	09, ND
VOAs	1,1,2,2-Tetrachloroethane/8260B/624	<10.0	µg/L	09, ND
VOAs	1,1,2-Trichloroethane/8260B/624	<10.0	µg/L	09, ND
VOAs	1,1-Dichloroethane/8260B/624	<10.0	µg/L	09, ND
VOAs	1,1-Dichloroethene/8260B/624	<10.0	µg/L	09, ND
VOAs	1,1-Dichloropropene/8260B/624	<10.0	µg/L	09, ND
VOAs	1,2,3-Trichlorobenzene/8260B/624	<50.0	µg/L	09, ND
VOAs	1,2,3-Trichloropropane/8260B/624	<20.0	µg/L	09, ND
VOAs	1,2,4-Trichlorobenzene/8260B/624	<50.0	µg/L	09, ND
VOAs	1,2,4-Trimethylbenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	1,2-Dibromo-3-chloropropane/8260B/624	<10.0	µg/L	09, ND
VOAs	1,2-Dibromoethane (EDB)/8260B/624	<10.0	µg/L	09, ND
VOAs	1,2-Dichlorobenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	1,2-Dichloroethane/8260B/624	<10.0	µg/L	09, ND
VOAs	1,2-Dichloropropane/8260B/624	<10.0	µg/L	09, ND
VOAs	1,3,5-Trimethylbenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	1,3-Dichlorobenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	1,3-Dichloropropane/8260B/624	<10.0	µg/L	09, ND
VOAs	1,4-Dichlorobenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	1-Chlorobutane/8260B/624	<10.0	µg/L	09, ND
VOAs	2,2-Dichloropropane/8260B/624	<10.0	µg/L	09, ND
VOAs	2-Butanone (MEK)/8260B/624	<50.0	µg/L	29, 09, ND
VOAs	2-Chlorotoluene/8260B/624	<10.0	µg/L	09, ND
VOAs	2-Hexanone/8260B/624	<20.0	µg/L	29, 09, ND
VOAs	2-Nitropropane/8260B/624	<10.0	µg/L	09, ND
VOAs	4-Chlorotoluene/8260B/624	<10.0	µg/L	09, ND
VOAs	4-Methyl-2-pentanone(MIBK)/8260B/624	<10.0	µg/L	09, ND
VOAs	acetone/8260B/624	<200	µg/L	09, ND
VOAs	Acrylonitrile/8260B/624	<20.0	µg/L	09, ND
VOAs	Allyl Chloride/8260B/624	<10.0	µg/L	09, ND
VOAs	Benzene/8260B/624	<10.0	µg/L	09, ND
VOAs	Bromobenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	Bromochloromethane/8260B/624	<10.0	µg/L	09, ND
VOAs	Bromodichloromethane/8260B/624	<10.0	µg/L	09, ND
VOAs	Bromoform/8260B/624	<10.0	µg/L	09, ND
VOAs	Bromomethane/8260B/624	<50.0	µg/L	29, 09, ND
VOAs	carbon disulfide/8260B/624	<10.0	µg/L	09, ND
VOAs	Carbon Tetrachloride/8260B/624	<10.0	µg/L	09, ND
VOAs	Chloroacetonitrile/8260B/624	<250	µg/L	09, ND
VOAs	Chlorobenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	Chloroethane/8260B/624	<50.0	µg/L	09, ND
VOAs	Chloroform/8260B/624	<10.0	µg/L	09, ND
VOAs	Chloromethane/8260B/624	<250	µg/L	09, ND
VOAs	cis-1,2-dichloroethene/8260B/624	<10.0	µg/L	09, ND

Sample: AD37551

Customer #: 184800

Site: Camdenton Treatment Plant Lagoon

County: Camden

Collect Date: 12/19/2018 10:05:00 AM

Collector: SEAN COUNIHAN

Affiliation: ESP/EER

Comments: Grab: Sample Number 184800. GW-01. West side of building.

Project: SI

VOAs	cis-1,3-Dichloropropene/8260B/624	<10.0	µg/L	09, ND
VOAs	Dibromochloromethane/8260B/624	<10.0	µg/L	09, ND
VOAs	Dibromomethane/8260B/624	<10.0	µg/L	09, ND
VOAs	Dichlorodifluoromethane/8260B/624	<10.0	µg/L	09, ND
VOAs	Diethyl ether/8260B/624	<200	µg/L	09, ND
VOAs	Ethylbenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	Ethylmethacrylate/8260B/624	<10.0	µg/L	29, 09, ND
VOAs	Hexachlorobutadiene/8260B/624	<20.0	µg/L	09, ND
VOAs	Hexachloroethane/8260B/624	<10.0	µg/L	09, ND
VOAs	Iodomethane/8260B/624	<50.0	µg/L	29, 09, ND
VOAs	Isopropylbenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	m&p-Xylenes/8260B/624	<10.0	µg/L	09, ND
VOAs	Methacrylonitrile/8260B/624	<10.0	µg/L	09, ND
VOAs	Methyl Acrylate/8260B/624	<100	µg/L	29, 09, ND
VOAs	Methylene chloride/8260B/624	<200	µg/L	09, ND
VOAs	Methylmethacrylate/8260B/624	<10.0	µg/L	09, ND
VOAs	Methyl-t-butyl ether/8260B/624	<10.0	µg/L	09, ND
VOAs	Naphthalene/8260B/624	<50.0	µg/L	09, ND
VOAs	n-Butylbenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	Nitrobenzene/8260B/624	<100	µg/L	09, ND
VOAs	n-Propylbenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	o-Xylene/8260B/624	<10.0	µg/L	09, ND
VOAs	Pentachloroethane/8260B/624	<10.0	µg/L	09, ND
VOAs	p-isopropyltoluene/8260B/624	<10.0	µg/L	09, ND
VOAs	Propionitrile/8260B/624	<200	µg/L	09, ND
VOAs	sec-Butylbenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	Styrene/8260B/624	<10.0	µg/L	09, ND
VOAs	tert-Butylbenzene/8260B/624	<20.0	µg/L	09, ND
VOAs	Tetrachloroethene/8260B/624	<10.0	µg/L	09, ND
VOAs	Tetrahydrofuran/8260B/624	<50.0	µg/L	09, ND
VOAs	Toluene/8260B/624	<10.0	µg/L	09, ND
VOAs	Total Xylenes/8260B/624	<20.0	µg/L	09, ND
VOAs	trans-1,2-Dichloroethene/8260B/624	<10.0	µg/L	09, ND
VOAs	trans-1,3-Dichloropropene/8260B/624	<10.0	µg/L	09, ND
VOAs	trans-1,4-Dichloro-2-butene/8260B/624	<10.0	µg/L	09, ND
VOAs	Trichloroethene/8260B/624	<10.0	µg/L	09, ND
VOAs	Trichlorofluoromethane/8260B/624	<50.0	µg/L	09, ND
VOAs	Vinyl Chloride/8260B/624	<10.0	µg/L	09, ND

Sample: AD37552

Customer #: 184801

Site: Camdenton Treatment Plant Lagoon

Collect Date: 12/19/2018 12:00:00 AM **Collector:** SEAN COUNIHAN

County: Camden

Affiliation: ESP/EER

Comments: Grab: Sample Number 184801. Blind duplicate.

Project: SI

Test	Parameter/Method	Result	Units	Qualifier(s)
VOAs	1,1,1,2-Tetrachloroethane/8260B/624	<10.0	µg/L	09, ND
VOAs	1,1,1-Trichloroethane/8260B/624	<10.0	µg/L	09, ND
VOAs	1,1,2,2-Tetrachloroethane/8260B/624	<10.0	µg/L	09, ND
VOAs	1,1,2-Trichloroethane/8260B/624	<10.0	µg/L	09, ND
VOAs	1,1-Dichloroethane/8260B/624	<10.0	µg/L	09, ND
VOAs	1,1-Dichloroethene/8260B/624	<10.0	µg/L	09, ND
VOAs	1,1-Dichloropropene/8260B/624	<10.0	µg/L	09, ND
VOAs	1,2,3-Trichlorobenzene/8260B/624	<50.0	µg/L	09, ND
VOAs	1,2,3-Trichloropropane/8260B/624	<20.0	µg/L	09, ND
VOAs	1,2,4-Trichlorobenzene/8260B/624	<50.0	µg/L	09, ND
VOAs	1,2,4-Trimethylbenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	1,2-Dibromo-3-chloropropane/8260B/624	<10.0	µg/L	09, ND
VOAs	1,2-Dibromoethane (EDB)/8260B/624	<10.0	µg/L	09, ND
VOAs	1,2-Dichlorobenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	1,2-Dichloroethane/8260B/624	<10.0	µg/L	09, ND
VOAs	1,2-Dichloropropane/8260B/624	<10.0	µg/L	09, ND
VOAs	1,3,5-Trimethylbenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	1,3-Dichlorobenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	1,3-Dichloropropane/8260B/624	<10.0	µg/L	09, ND
VOAs	1,4-Dichlorobenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	1-Chlorobutane/8260B/624	<10.0	µg/L	09, ND
VOAs	2,2-Dichloropropane/8260B/624	<10.0	µg/L	09, ND
VOAs	2-Butanone (MEK)/8260B/624	<50.0	µg/L	29, 09, ND
VOAs	2-Chlorotoluene/8260B/624	<10.0	µg/L	09, ND
VOAs	2-Hexanone/8260B/624	<20.0	µg/L	29, 09, ND
VOAs	2-Nitropropane/8260B/624	<10.0	µg/L	09, ND
VOAs	4-Chlorotoluene/8260B/624	<10.0	µg/L	09, ND
VOAs	4-Methyl-2-pentanone(MIBK)/8260B/624	<10.0	µg/L	09, ND
VOAs	acetone/8260B/624	<200	µg/L	09, ND
VOAs	Acrylonitrile/8260B/624	<20.0	µg/L	09, ND
VOAs	Allyl Chloride/8260B/624	<10.0	µg/L	09, ND
VOAs	Benzene/8260B/624	<10.0	µg/L	09, ND
VOAs	Bromobenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	Bromochloromethane/8260B/624	<10.0	µg/L	09, ND
VOAs	Bromodichloromethane/8260B/624	<10.0	µg/L	09, ND
VOAs	Bromoform/8260B/624	<10.0	µg/L	09, ND
VOAs	Bromomethane/8260B/624	<50.0	µg/L	29, 09, ND
VOAs	carbon disulfide/8260B/624	<10.0	µg/L	09, ND
VOAs	Carbon Tetrachloride/8260B/624	<10.0	µg/L	09, ND
VOAs	Chloroacetonitrile/8260B/624	<250	µg/L	09, ND
VOAs	Chlorobenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	Chloroethane/8260B/624	<50.0	µg/L	09, ND
VOAs	Chloroform/8260B/624	<10.0	µg/L	09, ND
VOAs	Chloromethane/8260B/624	<250	µg/L	09, ND
VOAs	cis-1,2-dichloroethene/8260B/624	<10.0	µg/L	09, ND
VOAs	cis-1,3-Dichloropropene/8260B/624	<10.0	µg/L	09, ND
VOAs	Dibromochloromethane/8260B/624	<10.0	µg/L	09, ND
VOAs	Dibromomethane/8260B/624	<10.0	µg/L	09, ND

Sample: AD37552

Customer #: 184801

Site: Camdenton Treatment Plant Lagoon

County: Camden

Collect Date: 12/19/2018 12:00:00 AM

Collector: SEAN COUNIHAN

Affiliation: ESP/EER

Comments: Grab: Sample Number 184801. Blind duplicate.

Project: S

VOAs	Dichlorodifluoromethane/8260B/624	<10.0	µg/L	09, ND
VOAs	Diethyl ether/8260B/624	<200	µg/L	09, ND
VOAs	Ethylbenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	Ethylmethacrylate/8260B/624	<10.0	µg/L	29, 09, ND
VOAs	Hexachlorobutadiene/8260B/624	<20.0	µg/L	09, ND
VOAs	Hexachloroethane/8260B/624	<10.0	µg/L	09, ND
VOAs	Iodomethane/8260B/624	<50.0	µg/L	29, 09, ND
VOAs	Isopropylbenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	m&p-Xylenes/8260B/624	<10.0	µg/L	09, ND
VOAs	Methacrylonitrile/8260B/624	<10.0	µg/L	09, ND
VOAs	Methyl Acrylate/8260B/624	<100	µg/L	29, 09, ND
VOAs	Methylene chloride/8260B/624	<200	µg/L	09, ND
VOAs	Methylmethacrylate/8260B/624	<10.0	µg/L	09, ND
VOAs	Methyl-t-butyl ether/8260B/624	<10.0	µg/L	09, ND
VOAs	Naphthalene/8260B/624	<50.0	µg/L	09, ND
VOAs	n-Butylbenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	Nitrobenzene/8260B/624	<100	µg/L	09, ND
VOAs	n-Propylbenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	o-Xylene/8260B/624	<10.0	µg/L	09, ND
VOAs	Pentachloroethane/8260B/624	<10.0	µg/L	09, ND
VOAs	p-isopropyltoluene/8260B/624	<10.0	µg/L	09, ND
VOAs	Propionitrile/8260B/624	<200	µg/L	09, ND
VOAs	sec-Butylbenzene/8260B/624	<10.0	µg/L	09, ND
VOAs	Styrene/8260B/624	<10.0	µg/L	09, ND
VOAs	tert-Butylbenzene/8260B/624	<20.0	µg/L	09, ND
VOAs	Tetrachloroethene/8260B/624	<10.0	µg/L	09, ND
VOAs	Tetrahydrofuran/8260B/624	<50.0	µg/L	09, ND
VOAs	Toluene/8260B/624	<10.0	µg/L	09, ND
VOAs	Total Xylenes/8260B/624	<20.0	µg/L	09, ND
VOAs	trans-1,2-Dichloroethene/8260B/624	<10.0	µg/L	09, ND
VOAs	trans-1,3-Dichloropropene/8260B/624	<10.0	µg/L	09, ND
VOAs	trans-1,4-Dichloro-2-butene/8260B/624	<10.0	µg/L	09, ND
VOAs	Trichloroethene/8260B/624	<10.0	µg/L	09, ND
VOAs	Trichlorofluoromethane/8260B/624	<50.0	µg/L	09, ND
VOAs	Vinyl Chloride/8260B/624	<10.0	µg/L	09, ND

Sample: AD37553

Customer #: 184802

Site: Camdenton Treatment Plant Lagoon

Collect Date: 12/19/2018 10:55:00 AM

Collector: SEAN COUNIHAN

County: Camden

Affiliation: ESP/EER

Comments: Grab: Sample Number 184802. SG-01-05. West side of building. Can # 3021.
Start Pressure = -29.3, End Pressure = -1.

Project: SI

Test	Parameter/Method	Result	Units	Qualifier(s)
TO-15	1,1,1-Trichloroethane/TO-15	<20	ppbv	04,ND
TO-15	1,1,2,2-Tetrachloroethane/TO-15	<20	ppbv	04,ND
TO-15	1,1,2-Trichloroethane/TO-15	<20	ppbv	04,ND
TO-15	1,1-Dichloroethane/TO-15	<20	ppbv	04,ND
TO-15	1,1-Dichloroethene/TO-15	<20	ppbv	04,ND
TO-15	1,2,4-Trichlorobenzene/TO-15	<81	ppbv	04,ND
TO-15	1,2,4-Trimethylbenzene/TO-15	<20	ppbv	04,ND
TO-15	1,2-Dibromoethane (EDB)/TO-15	<20	ppbv	04,ND
TO-15	1,2-Dichlorobenzene/TO-15	<20	ppbv	04,ND
TO-15	1,2-Dichloroethane/TO-15	<20	ppbv	04,ND
TO-15	1,2-Dichloropropane/TO-15	<20	ppbv	04,ND
TO-15	1,3,5-Trimethylbenzene/TO-15	<20	ppbv	04,ND
TO-15	1,3-Butadiene/TO-15	22	ppbv	04
TO-15	1,3-Dichlorobenzene/TO-15	<20	ppbv	04,ND
TO-15	1,4-Dichlorobenzene/TO-15	<20	ppbv	04,ND
TO-15	1,4-Dioxane/TO-15	<81	ppbv	04,ND
TO-15	2,2,4-Trimethylpentane/TO-15	14000	ppbv	04,07
TO-15	2-Butanone (MEK)/TO-15	<81	ppbv	04,ND
TO-15	2-Hexanone/TO-15	<81	ppbv	04,ND
TO-15	2-Propanol/TO-15	<81	ppbv	04,ND
TO-15	3-Chloropropene/TO-15	<81	ppbv	04,ND
TO-15	4-Ethyltoluene/TO-15	<20	ppbv	04,ND
TO-15	4-Methyl-2-pentanone(MIBK)/TO-15	<20	ppbv	04,ND
TO-15	Acetone/TO-15	<200	ppbv	04,ND
TO-15	Benzene/TO-15	57	ppbv	04
TO-15	Bromodichloromethane/TO-15	<20	ppbv	04,ND
TO-15	Bromoform/TO-15	<20	ppbv	04,ND
TO-15	Bromomethane/TO-15	<200	ppbv	04,ND
TO-15	Carbon Disulfide/TO-15	<81	ppbv	04,ND
TO-15	Carbon Tetrachloride/TO-15	<20	ppbv	04,ND
TO-15	Chlorobenzene/TO-15	<20	ppbv	04,ND
TO-15	Chloroethane/TO-15	<81	ppbv	04,ND
TO-15	Chloroform/TO-15	<20	ppbv	04,ND
TO-15	Chloromethane/TO-15	<200	ppbv	04,ND
TO-15	Chlorotoluene/TO-15	<20	ppbv	04,ND
TO-15	cis-1,2-dichloroethene/TO-15	<20	ppbv	04,ND
TO-15	cis-1,3-Dichloropropene/TO-15	<20	ppbv	04,ND
TO-15	Cumene/TO-15	<20	ppbv	04,ND
TO-15	Cyclohexane/TO-15	290	ppbv	04
TO-15	Dibromochloromethane/TO-15	<20	ppbv	04,ND
TO-15	Ethanol/TO-15	<81	ppbv	04,ND
TO-15	Ethylbenzene/TO-15	<20	ppbv	04,ND
TO-15	Freon 11/TO-15	<20	ppbv	04,ND
TO-15	Freon 113/TO-15	<20	ppbv	04,ND
TO-15	Freon 114/TO-15	<20	ppbv	04,ND
TO-15	Freon 12/TO-15	<20	ppbv	04,ND
TO-15	Heptane/TO-15	650	ppbv	04
TO-15	Hexachlorobutadiene/TO-15	<81	ppbv	04,ND
TO-15	Hexane/TO-15	590	ppbv	04
TO-15	m&p-Xylenes/TO-15	27	ppbv	04
TO-15	Methylene chloride/TO-15	<200	ppbv	04,ND

Customer #: 184802

Sample: AD37553

Site: Camdenton Treatment Plant Lagoon

County: Camden

Collect Date: 12/19/2018 10:55:00 AM

Collector: SEAN COUNIHAN

Affiliation: ESP/EER

Comments: Grab: Sample Number 184802. SG-01-05. West side of building.
Can # 3021.
Start Pressure = -29.3, End Pressure = -1.

Project: S

TO-15	Methyl-t-butyl ether/TO-15	<81	ppbv	04,ND
TO-15	o-Xylene/TO-15	<20	ppbv	04,ND
TO-15	Propylbenzene/TO-15	<20	ppbv	04,ND
TO-15	Styrene/TO-15	<20	ppbv	04,ND
TO-15	Tetrachloroethene/TO-15	<20	ppbv	04,ND
TO-15	Tetrahydrofuran/TO-15	<20	ppbv	04,ND
TO-15	Toluene/TO-15	67	ppbv	04
TO-15	trans-1,2-Dichloroethene/TO-15	<20	ppbv	04,ND
TO-15	trans-1,3-Dichloropropene/TO-15	<20	ppbv	04,ND
TO-15	Trichloroethene/TO-15	<20	ppbv	04,ND
TO-15	Vinyl Chloride/TO-15	<20	ppbv	04,ND

Sample: AD37554

Customer #: 184803

Site: Camdenton Treatment Plant Lagoon

Collect Date: 12/19/2018 12:02:00 PM

Collector: SEAN COUNIHAN

County: Camden

Affiliation: ESP/EER

Comments: Grab: Sample Number 184803. SG-01-10. West side of building. Can # 1L1607.
Start Pressure = -28.5, End Pressure = -3.

Project: SI

Test	Parameter/Method	Result	Units	Qualifier(s)
TO-15	1,1,1-Trichloroethane/TO-15	<1.1	ppbv	04,ND
TO-15	1,1,2,2-Tetrachloroethane/TO-15	<1.1	ppbv	04,ND
TO-15	1,1,2-Trichloroethane/TO-15	<1.1	ppbv	04,ND
TO-15	1,1-Dichloroethane/TO-15	<1.1	ppbv	04,ND
TO-15	1,1-Dichloroethene/TO-15	<1.1	ppbv	04,ND
TO-15	1,2,4-Trichlorobenzene/TO-15	<4.3	ppbv	04,ND
TO-15	1,2,4-Trimethylbenzene/TO-15	2.5	ppbv	04
TO-15	1,2-Dibromoethane (EDB)/TO-15	<1.1	ppbv	04,ND
TO-15	1,2-Dichlorobenzene/TO-15	<1.1	ppbv	04,ND
TO-15	1,2-Dichloroethane/TO-15	<1.1	ppbv	04,ND
TO-15	1,2-Dichloropropane/TO-15	<1.1	ppbv	04,ND
TO-15	1,3,5-Trimethylbenzene/TO-15	<1.1	ppbv	04,ND
TO-15	1,3-Butadiene/TO-15	31	ppbv	04
TO-15	1,3-Dichlorobenzene/TO-15	<1.1	ppbv	04,ND
TO-15	1,4-Dichlorobenzene/TO-15	<1.1	ppbv	04,ND
TO-15	1,4-Dioxane/TO-15	<4.3	ppbv	04,ND
TO-15	2,2,4-Trimethylpentane/TO-15	14	ppbv	04
TO-15	2-Butanone (MEK)/TO-15	19	ppbv	04
TO-15	2-Hexanone/TO-15	<4.3	ppbv	04,ND
TO-15	2-Propanol/TO-15	<4.3	ppbv	04,ND
TO-15	3-Chloropropene/TO-15	<4.3	ppbv	04,ND
TO-15	4-Ethyltoluene/TO-15	2.4	ppbv	04
TO-15	4-Methyl-2-pentanone(MIBK)/TO-15	<1.1	ppbv	04,ND
TO-15	Acetone/TO-15	48	ppbv	04
TO-15	Benzene/TO-15	7.4	ppbv	04
TO-15	Bromodichloromethane/TO-15	<1.1	ppbv	04,ND
TO-15	Bromoform/TO-15	<1.1	ppbv	04,ND
TO-15	Bromomethane/TO-15	<11	ppbv	04,ND
TO-15	Carbon Disulfide/TO-15	5.6	ppbv	04
TO-15	Carbon Tetrachloride/TO-15	<1.1	ppbv	04,ND
TO-15	Chlorobenzene/TO-15	<1.1	ppbv	04,ND
TO-15	Chloroethane/TO-15	<4.3	ppbv	04,ND
TO-15	Chloroform/TO-15	5.3	ppbv	04
TO-15	Chloromethane/TO-15	<11	ppbv	04,ND
TO-15	Chlorotoluene/TO-15	<1.1	ppbv	04,ND
TO-15	cis-1,2-dichloroethene/TO-15	<1.1	ppbv	04,ND
TO-15	cis-1,3-Dichloropropene/TO-15	<1.1	ppbv	04,ND
TO-15	Cumene/TO-15	<1.1	ppbv	04,ND
TO-15	Cyclohexane/TO-15	1.1	ppbv	04
TO-15	Dibromochloromethane/TO-15	<1.1	ppbv	04,ND
TO-15	Ethanol/TO-15	7.9	ppbv	04
TO-15	Ethylbenzene/TO-15	3.9	ppbv	04
TO-15	Freon 11/TO-15	<1.1	ppbv	04,ND
TO-15	Freon 113/TO-15	<1.1	ppbv	04,ND
TO-15	Freon 114/TO-15	<1.1	ppbv	04,ND
TO-15	Freon 12/TO-15	<1.1	ppbv	04,ND
TO-15	Heptane/TO-15	2.5	ppbv	04
TO-15	Hexachlorobutadiene/TO-15	<4.3	ppbv	04,ND
TO-15	Hexane/TO-15	4.7	ppbv	04
TO-15	m&p-Xylenes/TO-15	11	ppbv	04
TO-15	Methylene chloride/TO-15	<11	ppbv	04,ND

Customer #: 184803

Sample: AD37554

Site: Camdenton Treatment Plant Lagoon

County: Camden

Collect Date: 12/19/2018 12:02:00 PM

Collector: SEAN COUNIHAN

Affiliation: ESP/EER

Comments: Grab: Sample Number 184803. SG-01-10. West side of building.
Can # 1L1607.
Start Pressure = -28.5, End Pressure = -3.

Project: S

TO-15	Methyl-t-butyl ether/TO-15	<4.3	ppbv	04,ND
TO-15	o-Xylene/TO-15	3.5	ppbv	04
TO-15	Propylbenzene/TO-15	<1.1	ppbv	04,ND
TO-15	Styrene/TO-15	<1.1	ppbv	04,ND
TO-15	Tetrachloroethene/TO-15	4.0	ppbv	04
TO-15	Tetrahydrofuran/TO-15	<1.1	ppbv	04,ND
TO-15	Toluene/TO-15	22	ppbv	04
TO-15	trans-1,2-Dichloroethene/TO-15	<1.1	ppbv	04,ND
TO-15	trans-1,3-Dichloropropene/TO-15	<1.1	ppbv	04,ND
TO-15	Trichloroethene/TO-15	<1.1	ppbv	04,ND
TO-15	Vinyl Chloride/TO-15	<1.1	ppbv	04,ND

Sample: AD37555

Customer #: 184804

Site: Camdenton Treatment Plant Lagoon

County: Camden

Collect Date: 12/19/2018 12:35:00 PM

Collector: SEAN COUNIHAN

Affiliation: ESP/EER

Comments: Grab: Sample Number 184804. SG-02-05. South Side of building. Can # 1L1792.
Start Pressure = -29.8, End Pressure = -2.

Project: S

Test	Parameter/Method	Result	Units	Qualifier(s)
TO-15	1,1,1-Trichloroethane/TO-15	<2.0	ppbv	04,ND
TO-15	1,1,2,2-Tetrachloroethane/TO-15	<2.0	ppbv	04,ND
TO-15	1,1,2-Trichloroethane/TO-15	<2.0	ppbv	04,ND
TO-15	1,1-Dichloroethane/TO-15	<2.0	ppbv	04,ND
TO-15	1,1-Dichloroethene/TO-15	<2.0	ppbv	04,ND
TO-15	1,2,4-Trichlorobenzene/TO-15	<8.1	ppbv	04,ND
TO-15	1,2,4-Trimethylbenzene/TO-15	2.6	ppbv	04
TO-15	1,2-Dibromoethane (EDB)/TO-15	<2.0	ppbv	04,ND
TO-15	1,2-Dichlorobenzene/TO-15	<2.0	ppbv	04,ND
TO-15	1,2-Dichloroethane/TO-15	<2.0	ppbv	04,ND
TO-15	1,2-Dichloropropane/TO-15	<2.0	ppbv	04,ND
TO-15	1,3,5-Trimethylbenzene/TO-15	<2.0	ppbv	04,ND
TO-15	1,3-Butadiene/TO-15	<2.0	ppbv	04,ND
TO-15	1,3-Dichlorobenzene/TO-15	<2.0	ppbv	04,ND
TO-15	1,4-Dichlorobenzene/TO-15	<2.0	ppbv	04,ND
TO-15	1,4-Dioxane/TO-15	<8.1	ppbv	04,ND
TO-15	2,2,4-Trimethylpentane/TO-15	<2.0	ppbv	04,ND
TO-15	2-Butanone (MEK)/TO-15	<8.1	ppbv	04,ND
TO-15	2-Hexanone/TO-15	<8.1	ppbv	04,ND
TO-15	2-Propanol/TO-15	<8.1	ppbv	04,ND
TO-15	3-Chloropropene/TO-15	<8.1	ppbv	04,ND
TO-15	4-Ethyltoluene/TO-15	2.7	ppbv	04
TO-15	4-Methyl-2-pentanone(MIBK)/TO-15	<2.0	ppbv	04,ND
TO-15	Acetone/TO-15	<20	ppbv	04,ND
TO-15	Benzene/TO-15	<2.0	ppbv	04,ND
TO-15	Bromodichloromethane/TO-15	<2.0	ppbv	04,ND
TO-15	Bromoform/TO-15	<2.0	ppbv	04,ND
TO-15	Bromomethane/TO-15	<20	ppbv	04,ND
TO-15	Carbon Disulfide/TO-15	<8.1	ppbv	04,ND
TO-15	Carbon Tetrachloride/TO-15	<2.0	ppbv	04,ND
TO-15	Chlorobenzene/TO-15	<2.0	ppbv	04,ND
TO-15	Chloroethane/TO-15	<8.1	ppbv	04,ND
TO-15	Chloroform/TO-15	<2.0	ppbv	04,ND
TO-15	Chloromethane/TO-15	<20	ppbv	04,ND
TO-15	Chlorotoluene/TO-15	<2.0	ppbv	04,ND
TO-15	cis-1,2-dichloroethene/TO-15	<2.0	ppbv	04,ND
TO-15	cis-1,3-Dichloropropene/TO-15	<2.0	ppbv	04,ND
TO-15	Cumene/TO-15	<2.0	ppbv	04,ND
TO-15	Cyclohexane/TO-15	<2.0	ppbv	04,ND
TO-15	Dibromochloromethane/TO-15	<2.0	ppbv	04,ND
TO-15	Ethanol/TO-15	16	ppbv	04
TO-15	Ethylbenzene/TO-15	5.1	ppbv	04
TO-15	Freon 11/TO-15	<2.0	ppbv	04,ND
TO-15	Freon 113/TO-15	<2.0	ppbv	04,ND
TO-15	Freon 114/TO-15	<2.0	ppbv	04,ND
TO-15	Freon 12/TO-15	<2.0	ppbv	04,ND
TO-15	Heptane/TO-15	2.2	ppbv	04
TO-15	Hexachlorobutadiene/TO-15	<8.1	ppbv	04,ND
TO-15	Hexane/TO-15	<2.0	ppbv	04,ND
TO-15	m&p-Xylenes/TO-15	12	ppbv	04
TO-15	Methylene chloride/TO-15	<20	ppbv	04,ND

Customer #: 184804

Sample: AD37555

Site: Camdenton Treatment Plant Lagoon

County: Camden

Collect Date: 12/19/2018 12:35:00 PM

Collector: SEAN COUNIHAN

Affiliation: ESP/EER

Comments: Grab: Sample Number 184804. SG-02-05. South Side of building.
Can # 1L1792.
Start Pressure = -29.8, End Pressure = -2.

Project: S

TO-15	Methyl-t-butyl ether/TO-15	<8.1	ppbv	04,ND
TO-15	o-Xylene/TO-15	4.2	ppbv	04
TO-15	Propylbenzene/TO-15	<2.0	ppbv	04,ND
TO-15	Styrene/TO-15	<2.0	ppbv	04,ND
TO-15	Tetrachloroethene/TO-15	3.8	ppbv	04
TO-15	Tetrahydrofuran/TO-15	<2.0	ppbv	04,ND
TO-15	Toluene/TO-15	29	ppbv	04
TO-15	trans-1,2-Dichloroethene/TO-15	<2.0	ppbv	04,ND
TO-15	trans-1,3-Dichloropropene/TO-15	<2.0	ppbv	04,ND
TO-15	Trichloroethene/TO-15	<2.0	ppbv	04,ND
TO-15	Vinyl Chloride/TO-15	<2.0	ppbv	04,ND

Sample: AD37556

Customer #: 184805

Site: Camdenton Treatment Plant Lagoon

Collect Date: 12/19/2018 12:20:00 PM

Collector: SEAN COUNIHAN

County: Camden

Affiliation: ESP/EER

Comments: Grab: Sample Number 184805. SG-02-10. South side of building. Can # 1L2991.
Start Pressure = -29.2, End Pressure = -2.

Project: SI

Test	Parameter/Method	Result	Units	Qualifier(s)
TO-15	1,1,1-Trichloroethane/TO-15	<3.6	ppbv	04,ND
TO-15	1,1,2,2-Tetrachloroethane/TO-15	<3.6	ppbv	04,ND
TO-15	1,1,2-Trichloroethane/TO-15	<3.6	ppbv	04,ND
TO-15	1,1-Dichloroethane/TO-15	<3.6	ppbv	04,ND
TO-15	1,1-Dichloroethene/TO-15	<3.6	ppbv	04,ND
TO-15	1,2,4-Trichlorobenzene/TO-15	<14	ppbv	04,ND
TO-15	1,2,4-Trimethylbenzene/TO-15	<3.6	ppbv	04,ND
TO-15	1,2-Dibromoethane (EDB)/TO-15	<3.6	ppbv	04,ND
TO-15	1,2-Dichlorobenzene/TO-15	<3.6	ppbv	04,ND
TO-15	1,2-Dichloroethane/TO-15	<3.6	ppbv	04,ND
TO-15	1,2-Dichloropropane/TO-15	<3.6	ppbv	04,ND
TO-15	1,3,5-Trimethylbenzene/TO-15	<3.6	ppbv	04,ND
TO-15	1,3-Butadiene/TO-15	<3.6	ppbv	04,ND
TO-15	1,3-Dichlorobenzene/TO-15	<3.6	ppbv	04,ND
TO-15	1,4-Dichlorobenzene/TO-15	<3.6	ppbv	04,ND
TO-15	1,4-Dioxane/TO-15	<14	ppbv	04,ND
TO-15	2,2,4-Trimethylpentane/TO-15	<3.6	ppbv	04,ND
TO-15	2-Butanone (MEK)/TO-15	<14	ppbv	04,ND
TO-15	2-Hexanone/TO-15	<14	ppbv	04,ND
TO-15	2-Propanol/TO-15	<14	ppbv	04,ND
TO-15	3-Chloropropene/TO-15	<14	ppbv	04,ND
TO-15	4-Ethyltoluene/TO-15	<3.6	ppbv	04,ND
TO-15	4-Methyl-2-pentanone(MIBK)/TO-15	<3.6	ppbv	04,ND
TO-15	Acetone/TO-15	<36	ppbv	04,ND
TO-15	Benzene/TO-15	<3.6	ppbv	04,ND
TO-15	Bromodichloromethane/TO-15	<3.6	ppbv	04,ND
TO-15	Bromoform/TO-15	<3.6	ppbv	04,ND
TO-15	Bromomethane/TO-15	<36	ppbv	04,ND
TO-15	Carbon Disulfide/TO-15	<14	ppbv	04,ND
TO-15	Carbon Tetrachloride/TO-15	<3.6	ppbv	04,ND
TO-15	Chlorobenzene/TO-15	<3.6	ppbv	04,ND
TO-15	Chloroethane/TO-15	<14	ppbv	04,ND
TO-15	Chloroform/TO-15	<3.6	ppbv	04,ND
TO-15	Chloromethane/TO-15	<36	ppbv	04,ND
TO-15	Chlorotoluene/TO-15	<3.6	ppbv	04,ND
TO-15	cis-1,2-dichloroethene/TO-15	<3.6	ppbv	04,ND
TO-15	cis-1,3-Dichloropropene/TO-15	<3.6	ppbv	04,ND
TO-15	Cumene/TO-15	<3.6	ppbv	04,ND
TO-15	Cyclohexane/TO-15	<3.6	ppbv	04,ND
TO-15	Dibromochloromethane/TO-15	<3.6	ppbv	04,ND
TO-15	Ethanol/TO-15	20	ppbv	04
TO-15	Ethylbenzene/TO-15	5.2	ppbv	04
TO-15	Freon 11/TO-15	<3.6	ppbv	04,ND
TO-15	Freon 113/TO-15	<3.6	ppbv	04,ND
TO-15	Freon 114/TO-15	<3.6	ppbv	04,ND
TO-15	Freon 12/TO-15	<3.6	ppbv	04,ND
TO-15	Heptane/TO-15	<3.6	ppbv	04,ND
TO-15	Hexachlorobutadiene/TO-15	<14	ppbv	04,ND
TO-15	Hexane/TO-15	<3.6	ppbv	04,ND
TO-15	m&p-Xylenes/TO-15	11	ppbv	04
TO-15	Methylene chloride/TO-15	<36	ppbv	04,ND

Customer #: 184805

Sample: AD37556

Site: Camdenton Treatment Plant Lagoon

County: Camden

Collect Date: 12/19/2018 12:20:00 PM

Collector: SEAN COUNIHAN

Affiliation: ESP/EER

Comments: Grab: Sample Number 184805. SG-02-10. South side of building.
Can # 1L2991.
Start Pressure = -29.2, End Pressure = -2.

Project: S

TO-15	Methyl-t-butyl ether/TO-15	<14	ppbv	04,ND
TO-15	o-Xylene/TO-15	4.7	ppbv	04
TO-15	Propylbenzene/TO-15	<3.6	ppbv	04,ND
TO-15	Styrene/TO-15	<3.6	ppbv	04,ND
TO-15	Tetrachloroethene/TO-15	<3.6	ppbv	04,ND
TO-15	Tetrahydrofuran/TO-15	<3.6	ppbv	04,ND
TO-15	Toluene/TO-15	26	ppbv	04
TO-15	trans-1,2-Dichloroethene/TO-15	<3.6	ppbv	04,ND
TO-15	trans-1,3-Dichloropropene/TO-15	<3.6	ppbv	04,ND
TO-15	Trichloroethene/TO-15	<3.6	ppbv	04,ND
TO-15	Vinyl Chloride/TO-15	<3.6	ppbv	04,ND

Sample: AD37557

Customer #: 184806

Site: Camdenton Treatment Plant Lagoon

Collect Date: 12/19/2018 1:09:00 PM

Collector: SEAN COUNIHAN

County: Camden

Affiliation: ESP/EER

Comments: Grab: Sample Number 184806. SG-03-05. East side of building. Can # 1L2858.
Start Pressure = -29.7, End Pressure = -2.

Project: SI

Test	Parameter/Method	Result	Units	Qualifier(s)
TO-15	1,1,1-Trichloroethane/TO-15	<2.2	ppbv	04,ND
TO-15	1,1,2,2-Tetrachloroethane/TO-15	<2.2	ppbv	04,ND
TO-15	1,1,2-Trichloroethane/TO-15	<2.2	ppbv	04,ND
TO-15	1,1-Dichloroethane/TO-15	<2.2	ppbv	04,ND
TO-15	1,1-Dichloroethene/TO-15	<2.2	ppbv	04,ND
TO-15	1,2,4-Trichlorobenzene/TO-15	<8.7	ppbv	04,ND
TO-15	1,2,4-Trimethylbenzene/TO-15	2.6	ppbv	04
TO-15	1,2-Dibromoethane (EDB)/TO-15	<2.2	ppbv	04,ND
TO-15	1,2-Dichlorobenzene/TO-15	<2.2	ppbv	04,ND
TO-15	1,2-Dichloroethane/TO-15	<2.2	ppbv	04,ND
TO-15	1,2-Dichloropropane/TO-15	<2.2	ppbv	04,ND
TO-15	1,3,5-Trimethylbenzene/TO-15	<2.2	ppbv	04,ND
TO-15	1,3-Butadiene/TO-15	13	ppbv	04
TO-15	1,3-Dichlorobenzene/TO-15	<2.2	ppbv	04,ND
TO-15	1,4-Dichlorobenzene/TO-15	<2.2	ppbv	04,ND
TO-15	1,4-Dioxane/TO-15	<8.7	ppbv	04,ND
TO-15	2,2,4-Trimethylpentane/TO-15	4.1	ppbv	04
TO-15	2-Butanone (MEK)/TO-15	<8.7	ppbv	04,ND
TO-15	2-Hexanone/TO-15	<8.7	ppbv	04,ND
TO-15	2-Propanol/TO-15	<8.7	ppbv	04,ND
TO-15	3-Chloropropene/TO-15	<8.7	ppbv	04,ND
TO-15	4-Ethyltoluene/TO-15	<2.2	ppbv	04,ND
TO-15	4-Methyl-2-pentanone(MIBK)/TO-15	<2.2	ppbv	04,ND
TO-15	Acetone/TO-15	23	ppbv	04
TO-15	Benzene/TO-15	4.7	ppbv	04
TO-15	Bromodichloromethane/TO-15	<2.2	ppbv	04,ND
TO-15	Bromoform/TO-15	<2.2	ppbv	04,ND
TO-15	Bromomethane/TO-15	<22	ppbv	04,ND
TO-15	Carbon Disulfide/TO-15	<8.7	ppbv	04,ND
TO-15	Carbon Tetrachloride/TO-15	<2.2	ppbv	04,ND
TO-15	Chlorobenzene/TO-15	<2.2	ppbv	04,ND
TO-15	Chloroethane/TO-15	<8.7	ppbv	04,ND
TO-15	Chloroform/TO-15	<2.2	ppbv	04,ND
TO-15	Chloromethane/TO-15	<22	ppbv	04,ND
TO-15	Chlorotoluene/TO-15	<2.2	ppbv	04,ND
TO-15	cis-1,2-dichloroethene/TO-15	<2.2	ppbv	04,ND
TO-15	cis-1,3-Dichloropropene/TO-15	<2.2	ppbv	04,ND
TO-15	Cumene/TO-15	<2.2	ppbv	04,ND
TO-15	Cyclohexane/TO-15	3.3	ppbv	04
TO-15	Dibromochloromethane/TO-15	<2.2	ppbv	04,ND
TO-15	Ethanol/TO-15	16	ppbv	04
TO-15	Ethylbenzene/TO-15	4.3	ppbv	04
TO-15	Freon 11/TO-15	<2.2	ppbv	04,ND
TO-15	Freon 113/TO-15	<2.2	ppbv	04,ND
TO-15	Freon 114/TO-15	<2.2	ppbv	04,ND
TO-15	Freon 12/TO-15	<2.2	ppbv	04,ND
TO-15	Heptane/TO-15	4.8	ppbv	04
TO-15	Hexachlorobutadiene/TO-15	<8.7	ppbv	04,ND
TO-15	Hexane/TO-15	6.9	ppbv	04
TO-15	m&p-Xylenes/TO-15	10	ppbv	04
TO-15	Methylene chloride/TO-15	<22	ppbv	04,ND

Customer #: 184806

Sample: AD37557

Site: Camdenton Treatment Plant Lagoon

County: Camden

Collect Date: 12/19/2018 1:09:00 PM

Collector: SEAN COUNIHAN

Affiliation: ESP/EER

Comments: Grab: Sample Number 184806. SG-03-05. East side of building.
Can # 1L2858.
Start Pressure = -29.7, End Pressure = -2.

Project: S

TO-15	Methyl-t-butyl ether/TO-15	<8.7	ppbv	04,ND
TO-15	o-Xylene/TO-15	3.8	ppbv	04
TO-15	Propylbenzene/TO-15	<2.2	ppbv	04,ND
TO-15	Styrene/TO-15	<2.2	ppbv	04,ND
TO-15	Tetrachloroethene/TO-15	<2.2	ppbv	04,ND
TO-15	Tetrahydrofuran/TO-15	<2.2	ppbv	04,ND
TO-15	Toluene/TO-15	23	ppbv	04
TO-15	trans-1,2-Dichloroethene/TO-15	<2.2	ppbv	04,ND
TO-15	trans-1,3-Dichloropropene/TO-15	<2.2	ppbv	04,ND
TO-15	Trichloroethene/TO-15	<2.2	ppbv	04,ND
TO-15	Vinyl Chloride/TO-15	<2.2	ppbv	04,ND

Sample: AD37558

Customer #: 184807

Site: Camdenton Treatment Plant Lagoon

Collect Date: 12/19/2018 1:12:00 PM

Collector: SEAN COUNIHAN

County: Camden

Affiliation: ESP/EER

Comments: Grab: Sample Number 184807. SG-03-10. East side of building. Can # 1L2725.
Start Pressure = -29.0, End Pressure = -2.

Project: S

Test	Parameter/Method	Result	Units	Qualifier(s)
TO-15	1,1,1-Trichloroethane/TO-15	<1.0	ppbv	04,ND
TO-15	1,1,2,2-Tetrachloroethane/TO-15	<1.0	ppbv	04,ND
TO-15	1,1,2-Trichloroethane/TO-15	<1.0	ppbv	04,ND
TO-15	1,1-Dichloroethane/TO-15	<1.0	ppbv	04,ND
TO-15	1,1-Dichloroethene/TO-15	<1.0	ppbv	04,ND
TO-15	1,2,4-Trichlorobenzene/TO-15	<4.1	ppbv	04,ND
TO-15	1,2,4-Trimethylbenzene/TO-15	2.7	ppbv	04
TO-15	1,2-Dibromoethane (EDB)/TO-15	<1.0	ppbv	04,ND
TO-15	1,2-Dichlorobenzene/TO-15	<1.0	ppbv	04,ND
TO-15	1,2-Dichloroethane/TO-15	<1.0	ppbv	04,ND
TO-15	1,2-Dichloropropane/TO-15	<1.0	ppbv	04,ND
TO-15	1,3,5-Trimethylbenzene/TO-15	<1.0	ppbv	04,ND
TO-15	1,3-Butadiene/TO-15	14	ppbv	04
TO-15	1,3-Dichlorobenzene/TO-15	<1.0	ppbv	04,ND
TO-15	1,4-Dichlorobenzene/TO-15	<1.0	ppbv	04,ND
TO-15	1,4-Dioxane/TO-15	<4.1	ppbv	04,ND
TO-15	2,2,4-Trimethylpentane/TO-15	2.1	ppbv	04
TO-15	2-Butanone (MEK)/TO-15	4.2	ppbv	04
TO-15	2-Hexanone/TO-15	<4.1	ppbv	04,ND
TO-15	2-Propanol/TO-15	4.2	ppbv	04
TO-15	3-Chloropropene/TO-15	<4.1	ppbv	04,ND
TO-15	4-Ethyltoluene/TO-15	2.7	ppbv	04
TO-15	4-Methyl-2-pentanone(MIBK)/TO-15	<1.0	ppbv	04,ND
TO-15	Acetone/TO-15	18	ppbv	04
TO-15	Benzene/TO-15	4.5	ppbv	04
TO-15	Bromodichloromethane/TO-15	<1.0	ppbv	04,ND
TO-15	Bromoform/TO-15	<1.0	ppbv	04,ND
TO-15	Bromomethane/TO-15	<10	ppbv	04,ND
TO-15	Carbon Disulfide/TO-15	4.7	ppbv	04
TO-15	Carbon Tetrachloride/TO-15	<1.0	ppbv	04,ND
TO-15	Chlorobenzene/TO-15	<1.0	ppbv	04,ND
TO-15	Chloroethane/TO-15	<4.1	ppbv	04,ND
TO-15	Chloroform/TO-15	<1.0	ppbv	04,ND
TO-15	Chloromethane/TO-15	<10	ppbv	04,ND
TO-15	Chlorotoluene/TO-15	<1.0	ppbv	04,ND
TO-15	cis-1,2-dichloroethene/TO-15	<1.0	ppbv	04,ND
TO-15	cis-1,3-Dichloropropene/TO-15	<1.0	ppbv	04,ND
TO-15	Cumene/TO-15	<1.0	ppbv	04,ND
TO-15	Cyclohexane/TO-15	<1.0	ppbv	04,ND
TO-15	Dibromochloromethane/TO-15	<1.0	ppbv	04,ND
TO-15	Ethanol/TO-15	9.8	ppbv	04
TO-15	Ethylbenzene/TO-15	4.6	ppbv	04
TO-15	Freon 11/TO-15	<1.0	ppbv	04,ND
TO-15	Freon 113/TO-15	<1.0	ppbv	04,ND
TO-15	Freon 114/TO-15	<1.0	ppbv	04,ND
TO-15	Freon 12/TO-15	<1.0	ppbv	04,ND
TO-15	Heptane/TO-15	3.1	ppbv	04
TO-15	Hexachlorobutadiene/TO-15	<4.1	ppbv	04,ND
TO-15	Hexane/TO-15	3.1	ppbv	04
TO-15	m&p-Xylenes/TO-15	11	ppbv	04
TO-15	Methylene chloride/TO-15	<10	ppbv	04,ND

Customer #: 184807

Sample: AD37558

Site: Camdenton Treatment Plant Lagoon

County: Camden

Collect Date: 12/19/2018 1:12:00 PM

Collector: SEAN COUNIHAN

Affiliation: ESP/EER

Comments: Grab: Sample Number 184807. SG-03-10. East side of building.
Can # 1L2725.
Start Pressure = -29.0, End Pressure = -2.

Project: S

TO-15	Methyl-t-butyl ether/TO-15	<4.1	ppbv	04,ND
TO-15	o-Xylene/TO-15	4.1	ppbv	04
TO-15	Propylbenzene/TO-15	<1.0	ppbv	04,ND
TO-15	Styrene/TO-15	<1.0	ppbv	04,ND
TO-15	Tetrachloroethene/TO-15	2.7	ppbv	04
TO-15	Tetrahydrofuran/TO-15	<1.0	ppbv	04,ND
TO-15	Toluene/TO-15	25	ppbv	04
TO-15	trans-1,2-Dichloroethene/TO-15	<1.0	ppbv	04,ND
TO-15	trans-1,3-Dichloropropene/TO-15	<1.0.	ppbv	04,ND
TO-15	Trichloroethene/TO-15	<1.0	ppbv	04,ND
TO-15	Vinyl Chloride/TO-15	<1.0	ppbv	04,ND

Sample: AD37559

Customer #: 184808

Site: Camdenton Treatment Plant Lagoon

Collect Date: 12/19/2018 1:49:00 PM

Collector: SEAN COUNIHAN

County: Camden

Affiliation: ESP/EER

Comments: Grab: Sample Number 184808. SG-04-05. North side of building. Can # 1L1641.
Start Pressure = -29.3, End Pressure = -3.

Project: SI

Test	Parameter/Method	Result	Units	Qualifier(s)
TO-15	1,1,1-Trichloroethane/TO-15	<2.2	ppbv	04,ND
TO-15	1,1,2,2-Tetrachloroethane/TO-15	<2.2	ppbv	04,ND
TO-15	1,1,2-Trichloroethane/TO-15	<2.2	ppbv	04,ND
TO-15	1,1-Dichloroethane/TO-15	<2.2	ppbv	04,ND
TO-15	1,1-Dichloroethene/TO-15	<2.2	ppbv	04,ND
TO-15	1,2,4-Trichlorobenzene/TO-15	<8.6	ppbv	04,ND
TO-15	1,2,4-Trimethylbenzene/TO-15	2.4	ppbv	04
TO-15	1,2-Dibromoethane (EDB)/TO-15	<2.2	ppbv	04,ND
TO-15	1,2-Dichlorobenzene/TO-15	<2.2	ppbv	04,ND
TO-15	1,2-Dichloroethane/TO-15	<2.2	ppbv	04,ND
TO-15	1,2-Dichloropropane/TO-15	<2.2	ppbv	04,ND
TO-15	1,3,5-Trimethylbenzene/TO-15	<2.2	ppbv	04,ND
TO-15	1,3-Butadiene/TO-15	<2.2	ppbv	04,ND
TO-15	1,3-Dichlorobenzene/TO-15	<2.2	ppbv	04,ND
TO-15	1,4-Dichlorobenzene/TO-15	<2.2	ppbv	04,ND
TO-15	1,4-Dioxane/TO-15	<8.6	ppbv	04,ND
TO-15	2,2,4-Trimethylpentane/TO-15	11	ppbv	04
TO-15	2-Butanone (MEK)/TO-15	<8.6	ppbv	04,ND
TO-15	2-Hexanone/TO-15	<8.6	ppbv	04,ND
TO-15	2-Propanol/TO-15	<8.6	ppbv	04,ND
TO-15	3-Chloropropene/TO-15	<8.6	ppbv	04,ND
TO-15	4-Ethyltoluene/TO-15	2.3	ppbv	04
TO-15	4-Methyl-2-pentanone(MIBK)/TO-15	<2.2	ppbv	04,ND
TO-15	Acetone/TO-15	25	ppbv	04
TO-15	Benzene/TO-15	<2.2	ppbv	04,ND
TO-15	Bromodichloromethane/TO-15	<2.2	ppbv	04,ND
TO-15	Bromoform/TO-15	<2.2	ppbv	04,ND
TO-15	Bromomethane/TO-15	<22	ppbv	04,ND
TO-15	Carbon Disulfide/TO-15	<8.6	ppbv	04,ND
TO-15	Carbon Tetrachloride/TO-15	<2.2	ppbv	04,ND
TO-15	Chlorobenzene/TO-15	<2.2	ppbv	04,ND
TO-15	Chloroethane/TO-15	<8.6	ppbv	04,ND
TO-15	Chloroform/TO-15	<2.2	ppbv	04,ND
TO-15	Chloromethane/TO-15	<22	ppbv	04,ND
TO-15	Chlorotoluene/TO-15	<2.2	ppbv	04,ND
TO-15	cis-1,2-dichloroethene/TO-15	<2.2	ppbv	04,ND
TO-15	cis-1,3-Dichloropropene/TO-15	<2.2	ppbv	04,ND
TO-15	Cumene/TO-15	<2.2	ppbv	04,ND
TO-15	Cyclohexane/TO-15	<2.2	ppbv	04,ND
TO-15	Dibromochloromethane/TO-15	<2.2	ppbv	04,ND
TO-15	Ethanol/TO-15	57	ppbv	04
TO-15	Ethylbenzene/TO-15	4.1	ppbv	04
TO-15	Freon 11/TO-15	<2.2	ppbv	04,ND
TO-15	Freon 113/TO-15	<2.2	ppbv	04,ND
TO-15	Freon 114/TO-15	<2.2	ppbv	04,ND
TO-15	Freon 12/TO-15	<2.2	ppbv	04,ND
TO-15	Heptane/TO-15	<2.2	ppbv	04,ND
TO-15	Hexachlorobutadiene/TO-15	<8.6	ppbv	04,ND
TO-15	Hexane/TO-15	<2.2	ppbv	04,ND
TO-15	m&p-Xylenes/TO-15	10	ppbv	04
TO-15	Methylene chloride/TO-15	<22	ppbv	04,ND

Customer #: 184808

Sample: AD37559

Site: Camdenton Treatment Plant Lagoon

County: Camden

Collect Date: 12/19/2018 1:49:00 PM

Collector: SEAN COUNIHAN

Affiliation: ESP/EER

Comments: Grab: Sample Number 184808. SG-04-05. North side of building.
Can # 1L1641.
Start Pressure = -29.3, End Pressure = -3.

Project: S

TO-15	Methyl-t-butyl ether/TO-15	<8.6	ppbv	04,ND
TO-15	o-Xylene/TO-15	3.8	ppbv	04
TO-15	Propylbenzene/TO-15	<2.2	ppbv	04,ND
TO-15	Styrene/TO-15	<2.2	ppbv	04,ND
TO-15	Tetrachloroethene/TO-15	3.4	ppbv	04
TO-15	Tetrahydrofuran/TO-15	<2.2	ppbv	04,ND
TO-15	Toluene/TO-15	22	ppbv	04
TO-15	trans-1,2-Dichloroethene/TO-15	<2.2	ppbv	04,ND
TO-15	trans-1,3-Dichloropropene/TO-15	<2.2	ppbv	04,ND
TO-15	Trichloroethene/TO-15	<2.2	ppbv	04,ND
TO-15	Vinyl Chloride/TO-15	<2.2	ppbv	04,ND

Sample: AD37560

Customer #: 184809

Site: Camdenton Treatment Plant Lagoon

Collect Date: 12/19/2018 1:48:00 PM

Collector: SEAN COUNIHAN

County: Camden

Affiliation: ESP/EER

Comments: Grab: Sample Number 184809. SG-04-10. North side of building. Can # 3014.
Start Pressure = -29.9, End Pressure = -3.

Project: S

Test	Parameter/Method	Result	Units	Qualifier(s)
TO-15	1,1,1-Trichloroethane/TO-15	<1.0	ppbv	04,ND
TO-15	1,1,2,2-Tetrachloroethane/TO-15	<1.0	ppbv	04,ND
TO-15	1,1,2-Trichloroethane/TO-15	<1.0	ppbv	04,ND
TO-15	1,1-Dichloroethane/TO-15	<1.0	ppbv	04,ND
TO-15	1,1-Dichloroethene/TO-15	<1.0	ppbv	04,ND
TO-15	1,2,4-Trichlorobenzene/TO-15	<4.1	ppbv	04,ND
TO-15	1,2,4-Trimethylbenzene/TO-15	2.4	ppbv	04
TO-15	1,2-Dibromoethane (EDB)/TO-15	<1.0	ppbv	04,ND
TO-15	1,2-Dichlorobenzene/TO-15	<1.0	ppbv	04,ND
TO-15	1,2-Dichloroethane/TO-15	<1.0	ppbv	04,ND
TO-15	1,2-Dichloropropane/TO-15	<1.0	ppbv	04,ND
TO-15	1,3,5-Trimethylbenzene/TO-15	1.1	ppbv	04
TO-15	1,3-Butadiene/TO-15	11	ppbv	04
TO-15	1,3-Dichlorobenzene/TO-15	<1.0	ppbv	04,ND
TO-15	1,4-Dichlorobenzene/TO-15	<1.0	ppbv	04,ND
TO-15	1,4-Dioxane/TO-15	<4.1	ppbv	04,ND
TO-15	2,2,4-Trimethylpentane/TO-15	<1.0	ppbv	04,ND
TO-15	2-Butanone (MEK)/TO-15	<4.1	ppbv	04,ND
TO-15	2-Hexanone/TO-15	<4.1	ppbv	04,ND
TO-15	2-Propanol/TO-15	4.8	ppbv	04
TO-15	3-Chloropropene/TO-15	<4.1	ppbv	04,ND
TO-15	4-Ethyltoluene/TO-15	2.0	ppbv	04
TO-15	4-Methyl-2-pentanone(MIBK)/TO-15	<1.0	ppbv	04,ND
TO-15	Acetone/TO-15	20	ppbv	04
TO-15	Benzene/TO-15	3.3	ppbv	04
TO-15	Bromodichloromethane/TO-15	<1.0	ppbv	04,ND
TO-15	Bromoform/TO-15	<1.0	ppbv	04,ND
TO-15	Bromomethane/TO-15	<10	ppbv	04,ND
TO-15	Carbon Disulfide/TO-15	<4.1	ppbv	04,ND
TO-15	Carbon Tetrachloride/TO-15	<1.0	ppbv	04,ND
TO-15	Chlorobenzene/TO-15	<1.0	ppbv	04,ND
TO-15	Chloroethane/TO-15	<4.1	ppbv	04,ND
TO-15	Chloroform/TO-15	<1.0	ppbv	04,ND
TO-15	Chloromethane/TO-15	<10	ppbv	04,ND
TO-15	Chlorotoluene/TO-15	<1.0	ppbv	04,ND
TO-15	cis-1,2-dichloroethene/TO-15	<1.0	ppbv	04,ND
TO-15	cis-1,3-Dichloropropene/TO-15	<1.0	ppbv	04,ND
TO-15	Cumene/TO-15	<1.0	ppbv	04,ND
TO-15	Cyclohexane/TO-15	<1.0	ppbv	04,ND
TO-15	Dibromochloromethane/TO-15	<1.0	ppbv	04,ND
TO-15	Ethanol/TO-15	11	ppbv	04
TO-15	Ethylbenzene/TO-15	3.9	ppbv	04
TO-15	Freon 11/TO-15	<1.0	ppbv	04,ND
TO-15	Freon 113/TO-15	<1.0	ppbv	04,ND
TO-15	Freon 114/TO-15	<1.0	ppbv	04,ND
TO-15	Freon 12/TO-15	<1.0	ppbv	04,ND
TO-15	Heptane/TO-15	1.6	ppbv	04
TO-15	Hexachlorobutadiene/TO-15	<4.1	ppbv	04,ND
TO-15	Hexane/TO-15	1.7	ppbv	04
TO-15	m&p-Xylenes/TO-15	11	ppbv	04
TO-15	Methylene chloride/TO-15	<10	ppbv	04,ND

Customer #: 184809

Sample: AD37560

Site: Camdenton Treatment Plant Lagoon

County: Camden

Collect Date: 12/19/2018 1:48:00 PM

Collector: SEAN COUNIHAN

Affiliation: ESP/EER

Comments: Grab: Sample Number 184809. SG-04-10. North side of building.
Can # 3014.
Start Pressure = -29.9, End Pressure = -3.

Project: S

TO-15	Methyl-t-butyl ether/TO-15	<4.1	ppbv	04,ND
TO-15	o-Xylene/TO-15	3.8	ppbv	04
TO-15	Propylbenzene/TO-15	<1.0	ppbv	04,ND
TO-15	Styrene/TO-15	<1.0	ppbv	04,ND
TO-15	Tetrachloroethene/TO-15	3.1	ppbv	04
TO-15	Tetrahydrofuran/TO-15	<1.0	ppbv	04,ND
TO-15	Toluene/TO-15	19	ppbv	04
TO-15	trans-1,2-Dichloroethene/TO-15	<1.0	ppbv	04,ND
TO-15	trans-1,3-Dichloropropene/TO-15	<1.0	ppbv	04,ND
TO-15	Trichloroethene/TO-15	<1.0	ppbv	04,ND
TO-15	Vinyl Chloride/TO-15	<1.0	ppbv	04,ND

Sample: AD37561

Customer #: 184806

Site: Camdenton Treatment Plant Lagoon

Collect Date: 12/19/2018 2:17:00 PM

Collector: SEAN COUNIHAN

County: Camden

Affiliation: ESP/EER

Comments: Grab: Sample Number 184810. Ambient air.
Can # 1L2618.
Start Pressure = -29.8, End Pressure = -2.

Project: SI

Test	Parameter/Method	Result	Units	Qualifier(s)
TO-15	1,1,1-Trichloroethane/TO-15	<1.0	ppbv	04,ND
TO-15	1,1,2,2-Tetrachloroethane/TO-15	<1.0	ppbv	04,ND
TO-15	1,1,2-Trichloroethane/TO-15	<1.0	ppbv	04,ND
TO-15	1,1-Dichloroethane/TO-15	<1.0	ppbv	04,ND
TO-15	1,1-Dichloroethene/TO-15	<1.0	ppbv	04,ND
TO-15	1,2,4-Trichlorobenzene/TO-15	<4.2	ppbv	04,ND
TO-15	1,2,4-Trimethylbenzene/TO-15	<1.0	ppbv	04,ND
TO-15	1,2-Dibromoethane (EDB)/TO-15	<1.0	ppbv	04,ND
TO-15	1,2-Dichlorobenzene/TO-15	<1.0	ppbv	04,ND
TO-15	1,2-Dichloroethane/TO-15	<1.0	ppbv	04,ND
TO-15	1,2-Dichloropropane/TO-15	<1.0	ppbv	04,ND
TO-15	1,3,5-Trimethylbenzene/TO-15	<1.0	ppbv	04,ND
TO-15	1,3-Butadiene/TO-15	<1.0	ppbv	04,ND
TO-15	1,3-Dichlorobenzene/TO-15	<1.0	ppbv	04,ND
TO-15	1,4-Dichlorobenzene/TO-15	<1.0	ppbv	04,ND
TO-15	1,4-Dioxane/TO-15	<4.2	ppbv	04,ND
TO-15	2,2,4-Trimethylpentane/TO-15	<1.0	ppbv	04,ND
TO-15	2-Butanone (MEK)/TO-15	<4.2	ppbv	04,ND
TO-15	2-Hexanone/TO-15	<4.2	ppbv	04,ND
TO-15	2-Propanol/TO-15	1.1	ppbv	04,05
TO-15	3-Chloropropene/TO-15	<4.2	ppbv	04,ND
TO-15	4-Ethyltoluene/TO-15	<1.0	ppbv	04,ND
TO-15	4-Methyl-2-pentanone(MIBK)/TO-15	<1.0	ppbv	04,ND
TO-15	Acetone/TO-15	8.9	ppbv	04,05
TO-15	Benzene/TO-15	0.20	ppbv	04,05
TO-15	Bromodichloromethane/TO-15	<1.0	ppbv	04,ND
TO-15	Bromoform/TO-15	<1.0	ppbv	04,ND
TO-15	Bromomethane/TO-15	<10	ppbv	04,ND
TO-15	Carbon Disulfide/TO-15	<4.2	ppbv	04,ND
TO-15	Carbon Tetrachloride/TO-15	<1.0	ppbv	04,ND
TO-15	Chlorobenzene/TO-15	<1.0	ppbv	04,ND
TO-15	Chloroethane/TO-15	<4.2	ppbv	04,ND
TO-15	Chloroform/TO-15	<1.0	ppbv	04,ND
TO-15	Chloromethane/TO-15	<10	ppbv	04,ND
TO-15	Chlorotoluene/TO-15	<1.0	ppbv	04,ND
TO-15	cis-1,2-dichloroethene/TO-15	<1.0	ppbv	04,ND
TO-15	cis-1,3-Dichloropropene/TO-15	<1.0	ppbv	04,ND
TO-15	Cumene/TO-15	<1.0	ppbv	04,ND
TO-15	Cyclohexane/TO-15	<1.0	ppbv	04,ND
TO-15	Dibromochloromethane/TO-15	<1.0	ppbv	04,ND
TO-15	Ethanol/TO-15	<4.2	ppbv	04,ND
TO-15	Ethylbenzene/TO-15	<1.0	ppbv	04,ND
TO-15	Freon 11/TO-15	0.16	ppbv	04,05
TO-15	Freon 113/TO-15	<1.0	ppbv	04,ND
TO-15	Freon 114/TO-15	<1.0	ppbv	04,ND
TO-15	Freon 12/TO-15	0.46	ppbv	04,05
TO-15	Heptane/TO-15	<1.0	ppbv	04,ND
TO-15	Hexachlorobutadiene/TO-15	<4.2	ppbv	04,ND
TO-15	Hexane/TO-15	0.25	ppbv	04,05
TO-15	m&p-Xylenes/TO-15	<1.0	ppbv	04,ND
TO-15	Methylene chloride/TO-15	<10	ppbv	04,ND

Sample: AD37561

Customer #: 184806

Site: Camdenton Treatment Plant Lagoon

County: Camden

Collect Date: 12/19/2018 2:17:00 PM

Collector: SEAN COUNIHAN

Affiliation: ESP/EER

Comments: Grab: Sample Number 184810. Ambient air.
Can # 1L2618.
Start Pressure = -29.8, End Pressure = -2.

Project: S

TO-15	Methyl-t-butyl ether/TO-15	<4.2	ppbv	04,ND
TO-15	o-Xylene/TO-15	<1.0	ppbv	04,ND
TO-15	Propylbenzene/TO-15	<1.0	ppbv	04,ND
TO-15	Styrene/TO-15	<1.0	ppbv	04,ND
TO-15	Tetrachloroethene/TO-15	<1.0	ppbv	04,ND
TO-15	Tetrahydrofuran/TO-15	<1.0	ppbv	04,ND
TO-15	Toluene/TO-15	2.2	ppbv	04
TO-15	trans-1,2-Dichloroethene/TO-15	<1.0	ppbv	04,ND
TO-15	trans-1,3-Dichloropropene/TO-15	<1.0	ppbv	04,ND
TO-15	Trichloroethene/TO-15	<1.0	ppbv	04,ND
TO-15	Vinyl Chloride/TO-15	<1.0	ppbv	04,ND

The analysis of this sample was performed in accordance with procedures approved or recognized by the U. S. Environmental Protection Agency.

Data Qualifier(s)

04	Analyzed by contract laboratory	05	Estimated value, detected below PQL
07	Estimated value, analyte outside calibration range	09	Sample was diluted during analysis
29	Estimated value, QC data biased low	ND	Not detected at reported value

Kevin Thoenen

Kevin Thoenen,
Laboratory Manager
Environmental Services Program
Division of Environmental Quality

Missouri Department of Natural Resources
Environmental Services Program
PO Box 176 Jefferson City MO 65102-0176

RESULTS OF SAMPLE ANALYSES

LDPR/Job Code: FEPA3/NJ18CTPL

Program, Contact: HWP Valerie Wilder

Order ID: 190418006

Valerie Wilder
Hazardous Waste Program

Report Date: 4/25/2019

Customer #: 190171

Sample: AD47215

Site: Camdenton Treatment Plant Lagoon

County: Camden

Collect Date: 4/16/2019 2:30:00 PM

Collector: SEAN COUNIHAN

Affiliation: ESP/EER

Comments: Grab: Sample # 190171, Trip Blank

Project: S

Test	Parameter/Method	Result	Units	Qualifier(s)
VOAs	1,1,1,2-Tetrachloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1,1-Trichloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1,2,2-Tetrachloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1,2-Trichloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1-Dichloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1-Dichloroethene/8260B/624	<1	µg/L	ND
VOAs	1,1-Dichloropropene/8260B/624	<1	µg/L	ND
VOAs	1,2,3-Trichlorobenzene/8260B/624	<5	µg/L	ND
VOAs	1,2,3-Trichloropropane/8260B/624	<2	µg/L	ND
VOAs	1,2,4-Trichlorobenzene/8260B/624	<5	µg/L	ND
VOAs	1,2,4-Trimethylbenzene/8260B/624	<1	µg/L	ND
VOAs	1,2-Dibromo-3-chloropropane/8260B/624	<1	µg/L	ND
VOAs	1,2-Dibromoethane (EDB)/8260B/624	<1	µg/L	ND
VOAs	1,2-Dichlorobenzene/8260B/624	<1	µg/L	ND
VOAs	1,2-Dichloroethane/8260B/624	<1	µg/L	ND
VOAs	1,2-Dichloropropane/8260B/624	<1	µg/L	ND
VOAs	1,3,5-Trimethylbenzene/8260B/624	<1	µg/L	ND
VOAs	1,3-Dichlorobenzene/8260B/624	<1	µg/L	ND
VOAs	1,3-Dichloropropane/8260B/624	<1	µg/L	ND
VOAs	1,4-Dichlorobenzene/8260B/624	<1	µg/L	ND
VOAs	1-Chlorobutane/8260B/624	<1	µg/L	ND
VOAs	2,2-Dichloropropane/8260B/624	<1	µg/L	ND
VOAs	2-Butanone (MEK)/8260B/624	<5	µg/L	ND, 29
VOAs	2-Chlorotoluene/8260B/624	<1	µg/L	ND
VOAs	2-Hexanone/8260B/624	<2	µg/L	ND, 29
VOAs	2-Nitropropane/8260B/624	<1	µg/L	ND
VOAs	4-Chlorotoluene/8260B/624	<1	µg/L	ND
VOAs	4-Methyl-2-pentanone(MIBK)/8260B/624	<1	µg/L	ND
VOAs	Acetone/8260B/624	<20	µg/L	ND
VOAs	Acrylonitrile/8260B/624	<2	µg/L	ND

Sample: AD47215

Customer #: 190171

Site: Camdenton Treatment Plant Lagoon

Collect Date: 4/16/2019 2:30:00 PM

Collector: SEAN COUNIHAN

County: Camden

Affiliation: ESP/EER

Comments: Grab: Sample # 190171, Trip Blank

Project: SI

VOAs	Allyl Chloride/8260B/624	<1	µg/L	ND
VOAs	Benzene/8260B/624	<1	µg/L	ND
VOAs	Bromobenzene/8260B/624	<1	µg/L	ND
VOAs	Bromochloromethane/8260B/624	<1	µg/L	ND
VOAs	Bromodichloromethane/8260B/624	<1	µg/L	ND
VOAs	Bromoform/8260B/624	<1	µg/L	ND
VOAs	Bromomethane/8260B/624	<5	µg/L	ND
VOAs	Carbon Disulfide/8260B/624	<1	µg/L	ND
VOAs	Carbon Tetrachloride/8260B/624	<1	µg/L	ND
VOAs	Chloroacetonitrile/8260B/624	<25	µg/L	ND
VOAs	Chlorobenzene/8260B/624	<1	µg/L	ND
VOAs	Chloroethane/8260B/624	<5	µg/L	ND
VOAs	Chloroform/8260B/624	<1	µg/L	ND
VOAs	Chloromethane/8260B/624	<25	µg/L	ND
VOAs	cis-1,2-dichloroethene/8260B/624	<1	µg/L	ND
VOAs	cis-1,3-Dichloropropene/8260B/624	<1	µg/L	ND
VOAs	Dibromochloromethane/8260B/624	<1	µg/L	ND
VOAs	Dibromomethane/8260B/624	<1	µg/L	ND
VOAs	Dichlorodifluoromethane/8260B/624	<1	µg/L	ND
VOAs	Diethyl ether/8260B/624	<20	µg/L	ND
VOAs	Ethylbenzene/8260B/624	<1	µg/L	ND
VOAs	Ethylmethacrylate/8260B/624	<1	µg/L	ND
VOAs	Hexachlorobutadiene/8260B/624	<2	µg/L	ND, 29
VOAs	Hexachloroethane/8260B/624	<1	µg/L	ND
VOAs	Iodomethane/8260B/624	<5	µg/L	ND
VOAs	Isopropylbenzene/8260B/624	<1	µg/L	ND
VOAs	m&p-Xylenes/8260B/624	<1	µg/L	ND
VOAs	Methacrylonitrile/8260B/624	<1	µg/L	ND
VOAs	Methyl Acrylate/8260B/624	<10	µg/L	ND
VOAs	Methylene chloride/8260B/624	<20	µg/L	ND
VOAs	Methylmethacrylate/8260B/624	<1	µg/L	ND
VOAs	Methyl-t-butyl ether/8260B/624	<1	µg/L	ND
VOAs	Naphthalene/8260B/624	<5	µg/L	ND
VOAs	n-Butylbenzene/8260B/624	<1	µg/L	ND
VOAs	Nitrobenzene/8260B/624	<10	µg/L	ND
VOAs	n-Propylbenzene/8260B/624	<1	µg/L	ND
VOAs	o-Xylene/8260B/624	<1	µg/L	ND
VOAs	Pentachloroethane/8260B/624	<1	µg/L	ND
VOAs	p-isopropyltoluene/8260B/624	<1	µg/L	ND
VOAs	Propionitrile/8260B/624	<20	µg/L	ND
VOAs	sec-Butylbenzene/8260B/624	<1	µg/L	ND
VOAs	Styrene/8260B/624	<1	µg/L	ND
VOAs	tert-Butylbenzene/8260B/624	<2	µg/L	ND
VOAs	Tetrachloroethene/8260B/624	<1	µg/L	ND
VOAs	Tetrahydrofuran/8260B/624	<5	µg/L	ND
VOAs	Toluene/8260B/624	<1	µg/L	ND
VOAs	Total Xylenes/8260B/624	<2	µg/L	ND
VOAs	trans-1,2-Dichloroethene/8260B/624	<1	µg/L	ND
VOAs	trans-1,3-Dichloropropene/8260B/624	<1	µg/L	ND
VOAs	trans-1,4-Dichloro-2-butene/8260B/624	<1	µg/L	ND
VOAs	Trichloroethene/8260B/624	<1	µg/L	ND
VOAs	Trichlorofluoromethane/8260B/624	<5	µg/L	ND

Sample: AD47215

Customer #: 190171

Site: Camdenton Treatment Plant Lagoon

County: Camden

Collect Date: 4/16/2019 2:30:00 PM

Collector: SEAN COUNIHAN

Affiliation: ESP/EER

Comments: Grab: Sample # 190171, Trip Blank

Project: SI

VOAs	Vinyl Chloride/8260B/624	<1	µg/L	ND

Sample: AD47216

Customer #: 190172

Site: Camdenton Treatment Plant Lagoon

County: Camden

Collect Date: 4/17/2019 9:48:00 AM

Collector: SEAN COUNIHAN

Affiliation: ESP/EER

Comments: Grab: Sample # 190172, groundwater collected from SB-05 - northeast corner of old lagoon.

Project: SI

Test	Parameter/Method	Result	Units	Qualifier(s)
Field pH	Field pH/EPA 150.1	7.21	pH Units	
Field Specific Conductivity	Field Specific Conductivity/SM 2510	318.8 uS/cm		
Field Temperature	Field Temperature/EPA 170.1	14.1 C		
Flow	Flow/Field Dependent	100 ml/min		
VOAs	1,1,1,2-Tetrachloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1,1-Trichloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1,2,2-Tetrachloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1,2-Trichloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1-Dichloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1-Dichloroethene/8260B/624	<1	µg/L	ND
VOAs	1,1-Dichloropropene/8260B/624	<1	µg/L	ND
VOAs	1,2,3-Trichlorobenzene/8260B/624	<5	µg/L	ND
VOAs	1,2,3-Trichloropropane/8260B/624	<2	µg/L	ND
VOAs	1,2,4-Trichlorobenzene/8260B/624	<5	µg/L	ND
VOAs	1,2,4-Trimethylbenzene/8260B/624	<1	µg/L	ND
VOAs	1,2-Dibromo-3-chloropropane/8260B/624	<1	µg/L	ND
VOAs	1,2-Dibromoethane (EDB)/8260B/624	<1	µg/L	ND
VOAs	1,2-Dichlorobenzene/8260B/624	<1	µg/L	ND
VOAs	1,2-Dichloroethane/8260B/624	<1	µg/L	ND
VOAs	1,2-Dichloropropane/8260B/624	<1	µg/L	ND
VOAs	1,3,5-Trimethylbenzene/8260B/624	<1	µg/L	ND
VOAs	1,3-Dichlorobenzene/8260B/624	<1	µg/L	ND
VOAs	1,3-Dichloropropane/8260B/624	<1	µg/L	ND
VOAs	1,4-Dichlorobenzene/8260B/624	<1	µg/L	ND
VOAs	1-Chlorobutane/8260B/624	<1	µg/L	ND
VOAs	2,2-Dichloropropane/8260B/624	<1	µg/L	ND
VOAs	2-Butanone (MEK)/8260B/624	<5	µg/L	ND, 29
VOAs	2-Chlorotoluene/8260B/624	<1	µg/L	ND
VOAs	2-Hexanone/8260B/624	<2	µg/L	ND, 29
VOAs	2-Nitropropane/8260B/624	<1	µg/L	ND
VOAs	4-Chlorotoluene/8260B/624	<1	µg/L	ND
VOAs	4-Methyl-2-pentanone(MIBK)/8260B/624	<1	µg/L	ND
VOAs	Acetone/8260B/624	<20	µg/L	ND
VOAs	Acrylonitrile/8260B/624	<2	µg/L	ND
VOAs	Allyl Chloride/8260B/624	<1	µg/L	ND
VOAs	Benzene/8260B/624	<1	µg/L	ND
VOAs	Bromobenzene/8260B/624	<1	µg/L	ND
VOAs	Bromochloromethane/8260B/624	<1	µg/L	ND
VOAs	Bromodichloromethane/8260B/624	<1	µg/L	ND
VOAs	Bromoform/8260B/624	<1	µg/L	ND
VOAs	Bromomethane/8260B/624	<5	µg/L	ND
VOAs	Carbon Disulfide/8260B/624	<1	µg/L	ND
VOAs	Carbon Tetrachloride/8260B/624	<1	µg/L	ND
VOAs	Chloroacetonitrile/8260B/624	<25	µg/L	ND
VOAs	Chlorobenzene/8260B/624	<1	µg/L	ND
VOAs	Chloroethane/8260B/624	<5	µg/L	ND

Sample: AD47216 **Customer #:** 190172

Site: Camdenton Treatment Plant Lagoon **County:** Camden

Collect Date: 4/17/2019 9:48:00 AM **Collector:** SEAN COUNIHAN **Affiliation:** ESP/EER

Comments: Grab: Sample # 190172, groundwater collected from SB-05 - northeast corner of old lagoon.

Project: SI

VOAs	Chloroform/8260B/624	<1	µg/L	ND
VOAs	Chloromethane/8260B/624	<25	µg/L	ND
VOAs	cis-1,2-dichloroethene/8260B/624	<1	µg/L	ND
VOAs	cis-1,3-Dichloropropene/8260B/624	<1	µg/L	ND
VOAs	Dibromochloromethane/8260B/624	<1	µg/L	ND
VOAs	Dibromomethane/8260B/624	<1	µg/L	ND
VOAs	Dichlorodifluoromethane/8260B/624	<1	µg/L	ND
VOAs	Diethyl ether/8260B/624	<20	µg/L	ND
VOAs	Ethylbenzene/8260B/624	<1	µg/L	ND
VOAs	Ethylmethacrylate/8260B/624	<1	µg/L	ND, 29
VOAs	Hexachlorobutadiene/8260B/624	<2	µg/L	ND
VOAs	Hexachloroethane/8260B/624	<1	µg/L	ND
VOAs	Iodomethane/8260B/624	<5	µg/L	ND
VOAs	Isopropylbenzene/8260B/624	<1	µg/L	ND
VOAs	m&p-Xylenes/8260B/624	<1	µg/L	ND
VOAs	Methacrylonitrile/8260B/624	<1	µg/L	ND
VOAs	Methyl Acrylate/8260B/624	<10	µg/L	ND
VOAs	Methylene chloride/8260B/624	<20	µg/L	ND
VOAs	Methylmethacrylate/8260B/624	<1	µg/L	ND
VOAs	Methyl-t-butyl ether/8260B/624	<1	µg/L	ND
VOAs	Naphthalene/8260B/624	<5	µg/L	ND
VOAs	n-Butylbenzene/8260B/624	<1	µg/L	ND
VOAs	Nitrobenzene/8260B/624	<10	µg/L	ND
VOAs	n-Propylbenzene/8260B/624	<1	µg/L	ND
VOAs	o-Xylene/8260B/624	<1	µg/L	ND
VOAs	Pentachloroethane/8260B/624	<1	µg/L	ND
VOAs	p-isopropyltoluene/8260B/624	<1	µg/L	ND
VOAs	Propionitrile/8260B/624	<20	µg/L	ND
VOAs	sec-Butylbenzene/8260B/624	<1	µg/L	ND
VOAs	Styrene/8260B/624	<1	µg/L	ND
VOAs	tert-Butylbenzene/8260B/624	<2	µg/L	ND
VOAs	Tetrachloroethene/8260B/624	<1	µg/L	ND
VOAs	Tetrahydrofuran/8260B/624	<5	µg/L	ND
VOAs	Toluene/8260B/624	<1	µg/L	ND
VOAs	Total Xylenes/8260B/624	<2	µg/L	ND
VOAs	trans-1,2-Dichloroethene/8260B/624	<1	µg/L	ND
VOAs	trans-1,3-Dichloropropene/8260B/624	<1	µg/L	ND
VOAs	trans-1,4-Dichloro-2-butene/8260B/624	<1	µg/L	ND
VOAs	Trichloroethene/8260B/624	<1	µg/L	ND
VOAs	Trichlorofluoromethane/8260B/624	<5	µg/L	ND
VOAs	Vinyl Chloride/8260B/624	<1	µg/L	ND

Sample: AD47217 **Customer #:** 190173

Site: Camdenton Treatment Plant Lagoon **County:** Camden

Collect Date: 4/17/2019 10:25:00 AM **Collector:** SEAN COUNIHAN **Affiliation:** ESP/EER

Comments: Grab: Sample # 190173, groundwater collected from SB-06 - east edge near center of old lagoon.

Project: SI

Test	Parameter/Method	Result	Units	Qualifier(s)
Field pH	Field pH/EPA 150.1	7.09	pH Units	
Field Specific Conductivity	Field Specific Conductivity/SM 2510	323.0 uS/cm		
Field Temperature	Field Temperature/EPA 170.1	13.5 C		
Flow	Flow/Field Dependent	100 ml/min		
VOAs	1,1,1,2-Tetrachloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1,1-Trichloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1,2,2-Tetrachloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1,2-Trichloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1-Dichloroethane/8260B/624	<1	µg/L	ND
VOAs	1,1-Dichloroethene/8260B/624	<1	µg/L	ND
VOAs	1,1-Dichloropropene/8260B/624	<1	µg/L	ND
VOAs	1,2,3-Trichlorobenzene/8260B/624	<5	µg/L	ND
VOAs	1,2,3-Trichloropropane/8260B/624	<2	µg/L	ND
VOAs	1,2,4-Trichlorobenzene/8260B/624	<5	µg/L	ND
VOAs	1,2,4-Trimethylbenzene/8260B/624	<1	µg/L	ND
VOAs	1,2-Dibromo-3-chloropropane/8260B/624	<1	µg/L	ND
VOAs	1,2-Dibromoethane (EDB)/8260B/624	<1	µg/L	ND
VOAs	1,2-Dichlorobenzene/8260B/624	<1	µg/L	ND
VOAs	1,2-Dichloroethane/8260B/624	<1	µg/L	ND
VOAs	1,2-Dichloropropane/8260B/624	<1	µg/L	ND
VOAs	1,3,5-Trimethylbenzene/8260B/624	<1	µg/L	ND
VOAs	1,3-Dichlorobenzene/8260B/624	<1	µg/L	ND
VOAs	1,3-Dichloropropane/8260B/624	<1	µg/L	ND
VOAs	1,4-Dichlorobenzene/8260B/624	<1	µg/L	ND
VOAs	1-Chlorobutane/8260B/624	<1	µg/L	ND
VOAs	2,2-Dichloropropane/8260B/624	<1	µg/L	ND
VOAs	2-Butanone (MEK)/8260B/624	<5	µg/L	29, ND
VOAs	2-Chlorotoluene/8260B/624	<1	µg/L	ND
VOAs	2-Hexanone/8260B/624	<2	µg/L	29, ND
VOAs	2-Nitropropane/8260B/624	<1	µg/L	ND
VOAs	4-Chlorotoluene/8260B/624	<1	µg/L	ND
VOAs	4-Methyl-2-pentanone(MIBK)/8260B/624	<1	µg/L	ND
VOAs	Acetone/8260B/624	<20	µg/L	ND
VOAs	Acrylonitrile/8260B/624	<2	µg/L	ND
VOAs	Allyl Chloride/8260B/624	<1	µg/L	ND
VOAs	Benzene/8260B/624	<1	µg/L	ND
VOAs	Bromobenzene/8260B/624	<1	µg/L	ND
VOAs	Bromochloromethane/8260B/624	<1	µg/L	ND
VOAs	Bromodichloromethane/8260B/624	<1	µg/L	ND
VOAs	Bromoform/8260B/624	<1	µg/L	ND
VOAs	Bromomethane/8260B/624	<5	µg/L	ND
VOAs	Carbon Disulfide/8260B/624	<1	µg/L	ND
VOAs	Carbon Tetrachloride/8260B/624	<1	µg/L	ND
VOAs	Chloroacetonitrile/8260B/624	<25	µg/L	ND
VOAs	Chlorobenzene/8260B/624	<1	µg/L	ND
VOAs	Chloroethane/8260B/624	<5	µg/L	ND

Sample: AD47217 **Customer #:** 190173

Site: Camdenton Treatment Plant Lagoon **County:** Camden

Collect Date: 4/17/2019 10:25:00 AM **Collector:** SEAN COUNIHAN **Affiliation:** ESP/EER

Comments: Grab: Sample # 190173, groundwater collected from SB-06 - east edge near center of old lagoon.

Project: SI

VOAs	Chloroform/8260B/624	<1	µg/L	ND
VOAs	Chloromethane/8260B/624	<25	µg/L	ND
VOAs	cis-1,2-dichloroethene/8260B/624	<1	µg/L	ND
VOAs	cis-1,3-Dichloropropene/8260B/624	<1	µg/L	ND
VOAs	Dibromochloromethane/8260B/624	<1	µg/L	ND
VOAs	Dibromomethane/8260B/624	<1	µg/L	ND
VOAs	Dichlorodifluoromethane/8260B/624	<1	µg/L	ND
VOAs	Diethyl ether/8260B/624	<20	µg/L	ND
VOAs	Ethylbenzene/8260B/624	<1	µg/L	ND
VOAs	Ethylmethacrylate/8260B/624	<1	µg/L	29, ND
VOAs	Hexachlorobutadiene/8260B/624	<2	µg/L	ND
VOAs	Hexachloroethane/8260B/624	<1	µg/L	ND
VOAs	Iodomethane/8260B/624	<5	µg/L	ND
VOAs	Isopropylbenzene/8260B/624	<1	µg/L	ND
VOAs	m&p-Xylenes/8260B/624	<1	µg/L	ND
VOAs	Methacrylonitrile/8260B/624	<1	µg/L	ND
VOAs	Methyl Acrylate/8260B/624	<10	µg/L	ND
VOAs	Methylene chloride/8260B/624	<20	µg/L	ND
VOAs	Methylmethacrylate/8260B/624	<1	µg/L	ND
VOAs	Methyl-t-butyl ether/8260B/624	<1	µg/L	ND
VOAs	Naphthalene/8260B/624	<5	µg/L	ND
VOAs	n-Butylbenzene/8260B/624	<1	µg/L	ND
VOAs	Nitrobenzene/8260B/624	<10	µg/L	ND
VOAs	n-Propylbenzene/8260B/624	<1	µg/L	ND
VOAs	o-Xylene/8260B/624	<1	µg/L	ND
VOAs	Pentachloroethane/8260B/624	<1	µg/L	ND
VOAs	p-isopropyltoluene/8260B/624	<1	µg/L	ND
VOAs	Propionitrile/8260B/624	<20	µg/L	ND
VOAs	sec-Butylbenzene/8260B/624	<1	µg/L	ND
VOAs	Styrene/8260B/624	<1	µg/L	ND
VOAs	tert-Butylbenzene/8260B/624	<2	µg/L	ND
VOAs	Tetrachloroethene/8260B/624	<1	µg/L	ND
VOAs	Tetrahydrofuran/8260B/624	<5	µg/L	ND
VOAs	Toluene/8260B/624	<1	µg/L	ND
VOAs	Total Xylenes/8260B/624	<2	µg/L	ND
VOAs	trans-1,2-Dichloroethene/8260B/624	<1	µg/L	ND
VOAs	trans-1,3-Dichloropropene/8260B/624	<1	µg/L	ND
VOAs	trans-1,4-Dichloro-2-butene/8260B/624	<1	µg/L	ND
VOAs	Trichloroethene/8260B/624	<1	µg/L	ND
VOAs	Trichlorofluoromethane/8260B/624	<5	µg/L	ND
VOAs	Vinyl Chloride/8260B/624	<1	µg/L	ND

The analysis of this sample was performed in accordance with procedures approved or recognized by the U. S. Environmental Protection Agency.

Data Qualifier(s)

29	Estimated value, QC data biased low	ND	Not detected at reported value

Kevin Thoenen

Kevin Thoenen,
Laboratory Manager
Environmental Services Program
Division of Environmental Quality

Addendum Site Inspection Sampling and Analysis Report

Camdenton Treatment Plant Lagoon Site
Camdenton, Camden County, Missouri

Site Information:

ESP LDPR Code: FEPA3
ESP Staff: Sean Counihan, Andy Stivers, Caleb Troutt, Ken Hannon

Job Code: NJ18CTPL
Investigation Date: April 17, 2019

Introduction:

A Site Inspection was conducted at the Camdenton Treatment Plant Lagoon site on December 19, 2018 at the request of a public citizen concern group, as it relates to a former manufacturing facility at 221 Sunset Drive in Camdenton, MO. That facility discharged waste water containing trichloroethylene (TCE) to this lagoon site for a short time while it was in operation. After given the result of the December 2018 investigation, the concern group had further questions about the site and requested additional sampling. The Camdenton Treatment Plant Lagoon site is located at the end of Ha-Ha Tonka Road in Camdenton, MO, the geographical coordinates are 37.990862 decimal degrees latitude, -97.766473 decimal degrees longitude. The Missouri Department of Natural Resources (MoDNR) Division of Environmental Quality (DEQ) Environmental Remediation Program (ERP) Superfund Section, Site Assessment Unit requested the MoDNR Environmental Services Program (ESP) Field Services Unit (FSU) collect and analyze groundwater samples for volatile organics analysis in another section of the former two cell lagoon site.

Field Methods:

ESP personnel conducted groundwater sampling from several borings in the northern cell of the old lagoon. Sampling was conducted in accordance with the Quality Assurance Project Plan (QAPP) for Pre-Remedial/Pre-Removal Site Assessments, Revision 8, December 29, 2017, and ongoing.

ESP field personnel wore clean disposable nitrile gloves and changed as frequently as needed to eliminate cross-contamination. A Geoprobe hydraulic soil probe was used to advance, by direct push, a screen point sampler (SP16) to refusal, the expendable point released, and the rod string retracted approximately four feet to expose the sampler to the formation. A water level indicator was used to measure the groundwater level in each boring. The water level indicator was wiped clean with Simple Green 25% solution and rinsed with a distilled water wipe after each measurement. The SP16 was sprayed down with the 25% Simple Green Solution, scrubbed with a stiff bristle brush, and rinsed with clean water.

All borings were sampled using dedicated ¼-inch I.D. polyethylene tubing and MasterFlex tubing attached to a peristaltic pump. These wells were sampled using micro purge techniques with the flow volume set at approximately 100mL/minute. Water quality parameters were determined at three-minute intervals after a three minute purge was completed. Evacuation continued until the water quality parameters stabilized (pH within ± 0.2 units, and temperature and specific conductivity within ±10%) on two consecutive readings.

Water quality parameters (pH, specific conductivity, temperature) were determined and recorded at the time of collection for each sample. ESP personnel calibrated the YSI water quality meter prior to field work and following manufacturers' specifications. All evacuated water not used for sampling was disposed of on-site to the ground. All disposable equipment was containerized, transported back to Jefferson City, and then placed in the dumpster at the ESP building at the conclusion of the event. Refer to Table 1 for a listing of samples collected by ESP personnel.

Observations:

The sampling team arrived on site around 0900 hours. It was mostly cloudy to partly cloudy and temperatures were mild, 60-70 degrees Fahrenheit, with light shifting winds.

This sampling event was essentially a continuation of the soil borings that were conducted at the site in December 2018, the boring nomenclature resumed from where it was left from the December sampling event with SB-05. SB-05 began in the northeast corner of the old lagoon and then headed south along the edge of the old lagoon for two more locations. SB-07 hit refusal at 6 feet below the surface and produced no water. This hole was abandoned and a new location was chosen 10 feet to the west. The final three borings were conducted along the approximate center line of the old lagoon. SB-10 along the north edge of the center line also did not produce any water even though refusal (16 feet) was reached below the approximate water table depth. Refer to the sample location map for the approximate boring locations.

All of the groundwater samples were analyzed in the field using a Defiant Technology Frog 4000 mobile gas chromatograph (GC). The GC was operated in accordance with SOP MDNR-DEQ-HWP4000 and calibrated according to manufacturer specifications. Mobile GC analytical results are provided in Appendix C.

Five-milliliter groundwater samples were introduced into a glass sparge tube connected to the GC using a syringe. The sample was sparged with air, transferring VOCs to an absorbent trap which was then heated to transfer the VOCs into the GC column for separation. Compounds were detected using a photoionization detector operating at 10.6eV, identified based on retention

times and quantitated using the instrument's chromatographic PC software. Samples analyses was recorded on the Sample Run Log Form shown in Appendix C. Due to a miscommunication in the field, groundwater from some of the borings were mislabeled when entered into the mobile GC software. Corrective notes were later added to the data as shown in Appendix C.

Groundwater samples were collected from each of the borings that yielded water. Samples collected from SB-05 and SB-06, were also submitted to the ESP laboratory for comparison analysis. SB-05 and SB-06 were chosen to submit to the lab for comparison analysis because they were nearest to where the waste water would have entered the old lagoon. None of the groundwater samples showed any detections for the contaminants of concern through either mobile GC or lab based analysis. See Table 1 below for boring/groundwater information.

Results:

Groundwater samples selected for laboratory method comparison analysis were submitted to the ESP laboratory for volatile organics analysis by EPA method 8260B.

Table 1: Boring Log/Groundwater Information

Well Number	Sample Number	Time Collected	Temp (°C)	Conduct-ivity (µS/cm)	pH	Depth to Water (feet)	Total Depth (feet)
SB-05	190172	0948	14.1	318.8	7.21	4.0	8.0
SB-06	190173	1025	13.5	323.0	7.09	8.0	2.8
SB-07	No water					N/A	6.0
SB-08	Not submitted	1108	14.0	522.0	7.11	5.3	8.5
SB-09	Not submitted	1220	14.3	431.0	7.44	11.2	15.4
SB-10	No water					N/A	16.0
SB-11	Not submitted	1320	14.7	421.4	7.34	13.0	17.4

Submitted by:

Sean Counihan
Environmental Specialist
Field Services Unit
Environmental Services Program

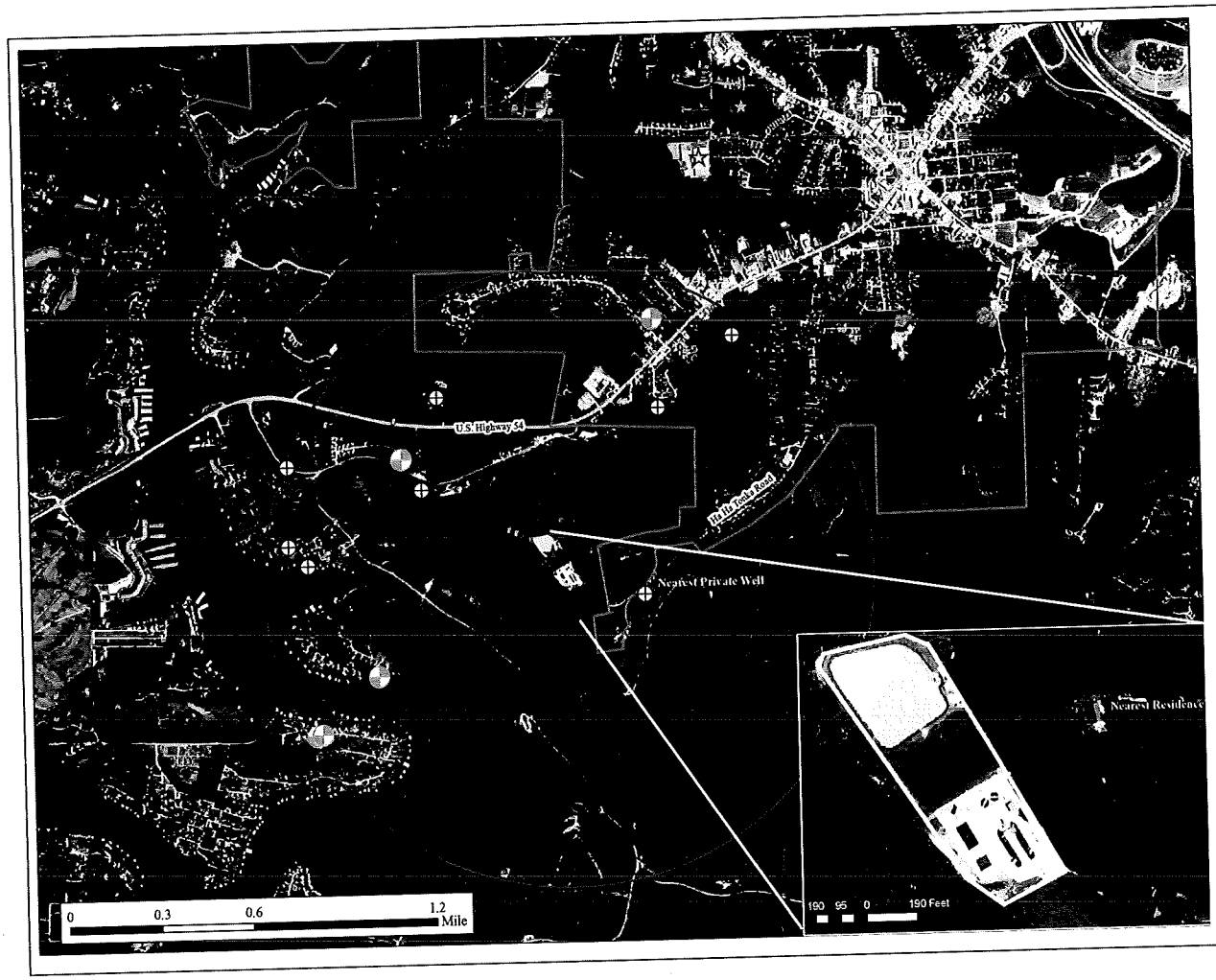
Approved by:

APPROVED
By Eric Sappington at 10:14 am, May 15, 2019

Eric J. Sappington
Unit Chief
Field Services Unit
Environmental Services Program

ES:smc

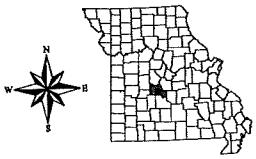
c: Michael Stroh, ERP



Site Location Map
Camdenton Treatment
Plant Lagoon
Camden County, Missouri

Legend

- Public Wells Within 1 Mile of Site
- Private Wells Within 1 Mile of Site
- NPDES Outfalls
- Camdenton Treatment Plant Lagoon
- City Lagoon #3
- 221 Sunset Drive Facility
- Former CTPL Lagoon Boundary
- Camdenton WWTP
- Camdenton Municipal Boundary



Created on: November 8, 2018 by Michael Stroh.
This map is located at M Superfund Camdenton Treatment Plant Lagoon Figure1 Site Location Map
Base Map: National Agriculture Imagery Program (NAIP) ortho photography. Flight Date: 2014
Data Sources: US Census 2010;
Missouri Department of Transportation

Although data sets used to create this map have been compiled by the Missouri Department of Natural Resources, no warranty, expressed or implied, is made by the department as to the accuracy of the data and related materials. The act of distribution shall not constitute any such warranty, and no responsibility is assumed by the department in the use of these data or related materials.

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Sample Locations Map, Camdenton Treatment Plant Lagoon site
Camdenton, MO April 17,2019
SB-05
SB-10
SB-06
SB-08
SB-09
SB-07
SB-11
Google Earth
© 2018 Google
N
400 ft

Appendix A:
Field Notes
Camdenton Treatment Plant Lagoon Site
Camdenton (Camden Co.)

Camden Treatment
Plant Lagoon Site
4/17/19 Sampling

4-16-19 Lab quality water check
YSI Cleaned Allin one
- pH at 7 reads 7.08 ✓
- pH at 4 reads 4.05 ✓
Cond at 1413 uS reads 1485 uS ✓

Trip Blank collected @ 1430 hours
Sample # 190171

Arrive on site 0900
SB-05 North ~~South~~ East corner of old lagoon
Refusal at 8 ft
Total w/ Rod 10.8
rod out of ground 3.8
depth to water 7.8 - 3.8 = 4 ft
Started purge at 0900 flow @ 100 ml/m
pH 7.11
Cond 323.5
Temp 14.5°C

@ 9:10 pH 7.21
Cond 318 uS Temp 14.12

Sample collected @ 0905
Sample # 190172

SB-06 East side along edge ~~North~~ center of old
Lagoon Refusal at 8 ft
depth to water 2.847
Total 5.47
rod out of ground level
Started purge at 1016
flow rate at 100 ml/m
1st read at 1019
Temp = 13.7°C
Cond = 329.2 uS
pH = 7.07

2nd read at 1022
Temp = 13.5°C
Cond = 323 uS
pH = 7.09
Sample collected at 1025
Sample # 190173

SB-07 Southwest corner
of old lagoon
Arrived at [illegible]
Depth to water = 5.57 ft
[illegible] not enough volume
Moved 125 [illegible]

SB-08
Arrived at 8.5 ft
Depth to water 5.3 ft
Started purge at 1100
Flow rate at 100ml/min.
1st read at 1103
Temp = 14.6°C
Cond = 533 uS
pH = 7.11
2nd read at 1106
Temp = ran dry after 2nd read
Cond = collected anyway
pH = at 1108
Sample # 190174

SB-09 Center of lagoon
Arrived at 1145
Depth to water = 11.2 ft + rising
Started purge @ 1146
Flow rate at 100 ml/min
1st read at 1149
Temp = 14.4°C
Cond = 440 uS
pH = 7.66
2nd read at 1218 ran dry [illegible]
Temp 13.3°C [illegible]
Cond 531.0 [illegible]
pH 7.04
Sample collected at 1220
Sample # 190175

SB-10 North edge of center ~~Central~~
refusal at 16ft
Dry no water Broken
abandone

SB-11 South edge of center ~~Central~~ of
old lagoon
refusal at 17ft
Depth to water 13 ft & rising
Started pump at 1312
Flow rate = 100 ml/min
1st read at 1315
Temp = 15.8°C
Cond = 436.4uS
pH = 7.39
2nd read at 1318
Temp = 14.7°C
Cond = 421.4uS
pH = 7.34
Sample collected at 1320
Sample # 19076

Appendix B:
Chain of Custody
Camdenton Treatment Plant Lagoon Site
Camdenton (Camden Co.)

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FIELD SHEET AND CHAIN-OF-CUSTODY RECORD

Description of Delivery
- ☐ Tape sealed and initialed
- ☐ Shipped
- ☑ Hand Delivered

Total No. Of Containers: 6
Carrier:
By:

Collector's Name: Sean Counihan
(Please Print)

Affiliation: ☐KCRO ☐NERO ☐SLRO ☐SLRO ☐SWRO ☐WPP ☐MGS ☐HWP ☑ESP ☐MoDOT ☐MDC ☐DHSS ☐Other:

LAB USE ONLY!
Laboratory ID: 190418006
Location: B26

Sample Number	Sample Collected	Analyses Requested	Disinfect. Type (check one)	Field Parameters (include units)	Matrix (check one)	Container Type	Preservative Type	Number of Containers
190171 (Sample A) / For Lab Use Only AD47215	Date: 4/16/2019 Time: 1430	VOA	☑None ☐Chlorine ☐UV ☐Ozone ☐Other:	D.O. Flow pH Cond. Temp. Other:	☑Water ☐Soil ☐Organic ☐Sludge ☐Other:	40 mL AG	HCL	2
190172 (Sample B) / For Lab Use Only AD 47216	Date: 4/17/2019 Time: 0948	VOA	☑None ☐Chlorine ☐UV ☐Ozone ☐Other:	D.O. Flow 100 ml/min pH 7.21 Cond. 318.8µs/cm Temp. 14.1°C Other:	☑Water ☐Soil ☐Organic ☐Sludge ☐Other:	40 mL AG	HCL	2
190173 (Sample C) / For Lab Use Only AD 47217	Date 4/17/2019 Time 1025	VOA	☑None ☐Chlorine ☐UV ☐Ozone ☐Other:	D.O. Flow 100ml/min pH 7.09 Cond. 323.0µs/cm Temp. 13.5°C Other:	☑Water ☐Soil ☐Organic ☐Sludge ☐Other:	40 mL AG	HCL	2
(Sample D) / For Lab Use Only	Date: Time:		☐None ☐Chlorine ☐UV ☐Ozone ☐Other:	D.O. Flow pH Cond. Temp. Other:	☐Water ☐Soil ☐Organic ☐Sludge ☐Other:			

Relinquished By:	Received By:	Date:	Time:
		4-18-19	0845
Relinquished By:	Received By:	Date:	Time:
Relinquished By:	Received By:	Date:	Time:

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FIELD SHEET AND CHAIN-OF-CUSTODY RECORD

Sample A

LDPR: FEPA3 | Job Code: NJ18CTPL | Sample Reference ID:

Facility ID: | Site/Study Name: Camdenton Treatment Plant Lagoon | County: Camden

Sample Comment (where and how the sample was collected): ☑ Grab ☐ Composite ☐ Modified ☐ Other:
Sample # 190171, Trip Blank

GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one)
			☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☑ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☐ Air
- ☐ Container
- ☐ QA/QC
- ☑ Groundwater
- ☐ Organic
- ☐ Sediment
- ☐ Sludge
- ☐ Drinking Water Supply
- ☐ Soil
- ☐ Spill
- ☐ Wipes
- ☐ Storm Water
- ☐ Surface Water
- ☐ Discharge

Sample B

LDPR: FEPA3 | Job Code: NJ18CTPL | Sample Reference ID:

Facility ID: | Site/Study Name: Camdenton Treatment Plant Lagoon | County: Camden

Sample Comment (where and how the sample was collected): ☑ Grab ☐ Composite ☐ Modified ☐ Other:
Sample # 190172, groundwater collected from SB-05 - northeast corner of old lagoon

GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one)
			☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☑ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☐ Air
- ☐ Container
- ☐ QA/QC
- ☑ Groundwater
- ☐ Organic
- ☐ Sediment
- ☐ Sludge
- ☐ Drinking Water Supply
- ☐ Soil
- ☐ Spill
- ☐ Wipes
- ☐ Storm Water
- ☐ Surface Water
- ☐ Discharge

Sample C

LDPR: FEPA3 | Job Code: NJ18CTPL | Sample Reference ID:

Facility ID: | Site/Study Name: Camdenton Treatment Plant Lagoon | County: Camden

Sample Comment (where and how the sample was collected): ☑ Grab ☐ Composite ☐ Modified ☐ Other:
Sample # 190173, groundwater collected from SB-06 - east edge near center of old lagoon

GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one)
			☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☑ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☐ Air
- ☐ Container
- ☐ QA/QC
- ☑ Groundwater
- ☐ Organic
- ☐ Sediment
- ☐ Sludge
- ☐ Drinking Water Supply
- ☐ Soil
- ☐ Spill
- ☐ Wipes
- ☐ Storm Water
- ☐ Surface Water
- ☐ Discharge

Sample D

LDPR: | Job Code: | Sample Reference ID:

Facility ID: | Site/Study Name: | County:

Sample Comment (where and how the sample was collected): ☐ Grab ☐ Composite ☐ Modified ☐ Other:

GPS Coordinates (UTM Zone 15 NAD83 Only)	X Easting	Y Northing	Accuracy (check one)
			☐ EPE (meters) ☐ PDOP

Sample Event Type: (check one)
- ☐ Bypass/SSO
- ☐ Complaint
- ☐ Emergency Response
- ☐ Inspection
- ☐ Investigation
- ☐ Monitoring
- ☐ Special Project

Sample Type: (check one)
- ☐ Air
- ☐ Container
- ☐ QA/QC
- ☐ Groundwater
- ☐ Organic
- ☐ Sediment
- ☐ Sludge
- ☐ Drinking Water Supply
- ☐ Soil
- ☐ Spill
- ☐ Wipes
- ☐ Storm Water
- ☐ Surface Water
- ☐ Discharge

Remarks:

5C

MDNR Environmental Services Program
2710 West Main, Jefferson City, MO 65109 (573) 526-3315

Appendix C:
Field and Laboratory Analytical Results
Camdenton Treatment Plant Lagoon Site
Camdenton (Camden Co.)

Mobile GC Sample Analysis Log

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Date	Elvin File Name (Log_xxx)	Sample Description	Concentration, µg/L						
			VC	DCE	trans	cis	TCE	PERC	
4-17-19	LOG_811	BLANK1 (0928_LOG_811)							RUN UNLEVELED
	0934_LOG_811	METHOD BLANK #1							
	0941_LOG_812(1)	VALCHECK SAMPLE 40 ppb	—	40.64	45.42	41.39	40.76	35.65	
	0949_LOG_813	METHOD BLANK #2							
	0956_LOG_814	METHOD BLANK #3							
	1002_LOG_814	SB 05 4' TO 8' UNDILUTED	ND	ND	ND	ND	ND	ND	
	1027_LOG_814	SB 06 4' TO 8' UNDILUTED	ND	ND	ND	ND	ND	NA	ENDED/RUN CANCEL/NOT ENTERED
	1032_LOG_814	SB 06 4' TO 8' UNDIL RUN#2	ND	ND	ND	ND	ND	ND	
	1110 LOG_811	SB 08 4' TO 8' UNDIL UNLEVELED							
	1110 LOG_816	SB08 4' TO 8' UNDIL							
	1115 LOG_816	SB 08 4' TO 8' UNDIL	ND	ND	ND	ND	ND	ND	
	1202 LOG_817	STORMWATER BASIN SW	ND	ND	ND	ND	ND	ND	
	1223 LOG_818(2)	SB 09 11.4' TO 15.4' UNDIL							UNLEVELED
	1228 LOG_818	SB09 11.4' TO 15.4' UNDIL	ND	ND	ND	ND	ND	ND	
		SB10 DRY 16' DEPTH							
4-17-19	1323 LOG_819	SB11 13.4' TO 17.4' DEPTH	ND	ND	ND	ND	ND	ND	
4-17-19		SB07 DRY							

Mobile GC
Initial Calibration Data

April 15, 2019

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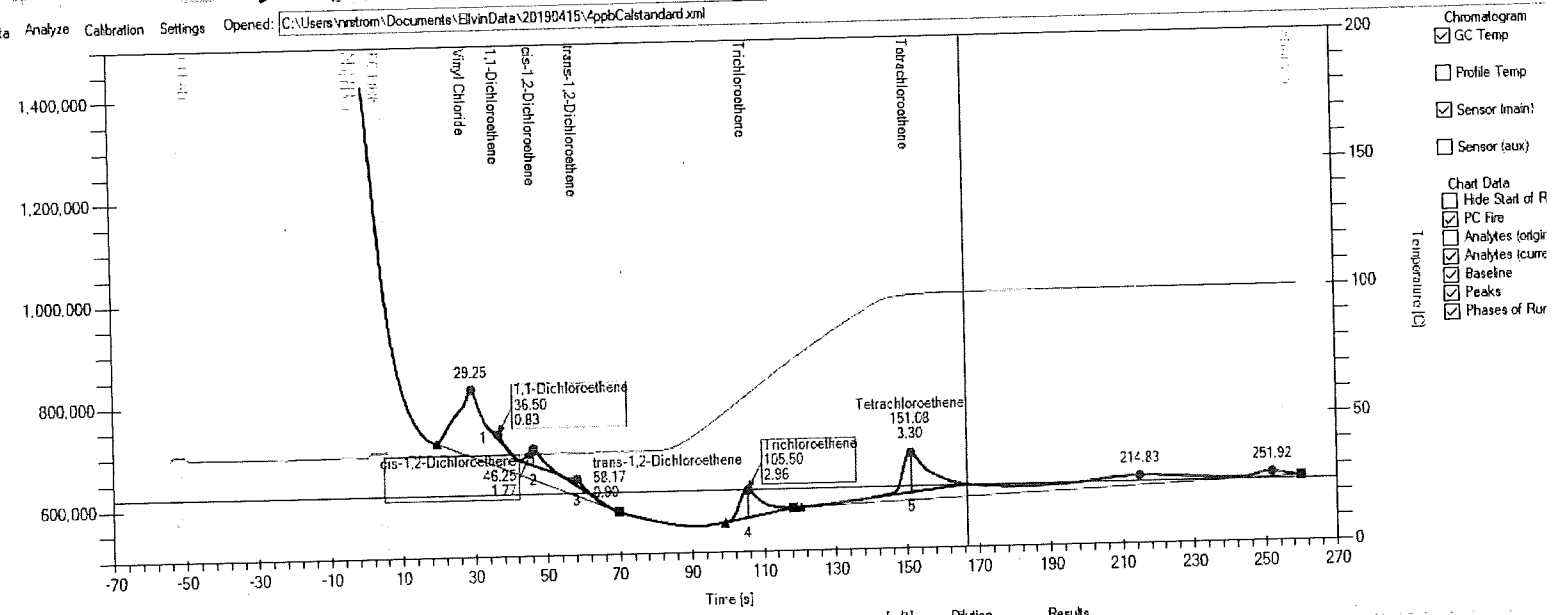

[edit]

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ndard 4ppb

Dilution 1.0

Operations

Flatten Beta

Auto Analyze

View Report

Results

Analyte	Peak	Time	Height	Area	Concentration	Final Co
1,1-Dichloroe...	1	36.5	7259	18888	0.83	
cis-1,2-Dichlo...	2	46.25	32394	162468	1.77	
trans-1,2-Dic...	3	58.17	12881	49155	0.90	
Trichloroethe...	4	105.5	53439	385805	2.96	
Tetrachloroet...	5	151.08	77253	640613	2.30	

ONNECTED ... X: 0.00 Y: 0 Y2: 0.00 ANALYZE: 0.0 0.0

7:53 AM

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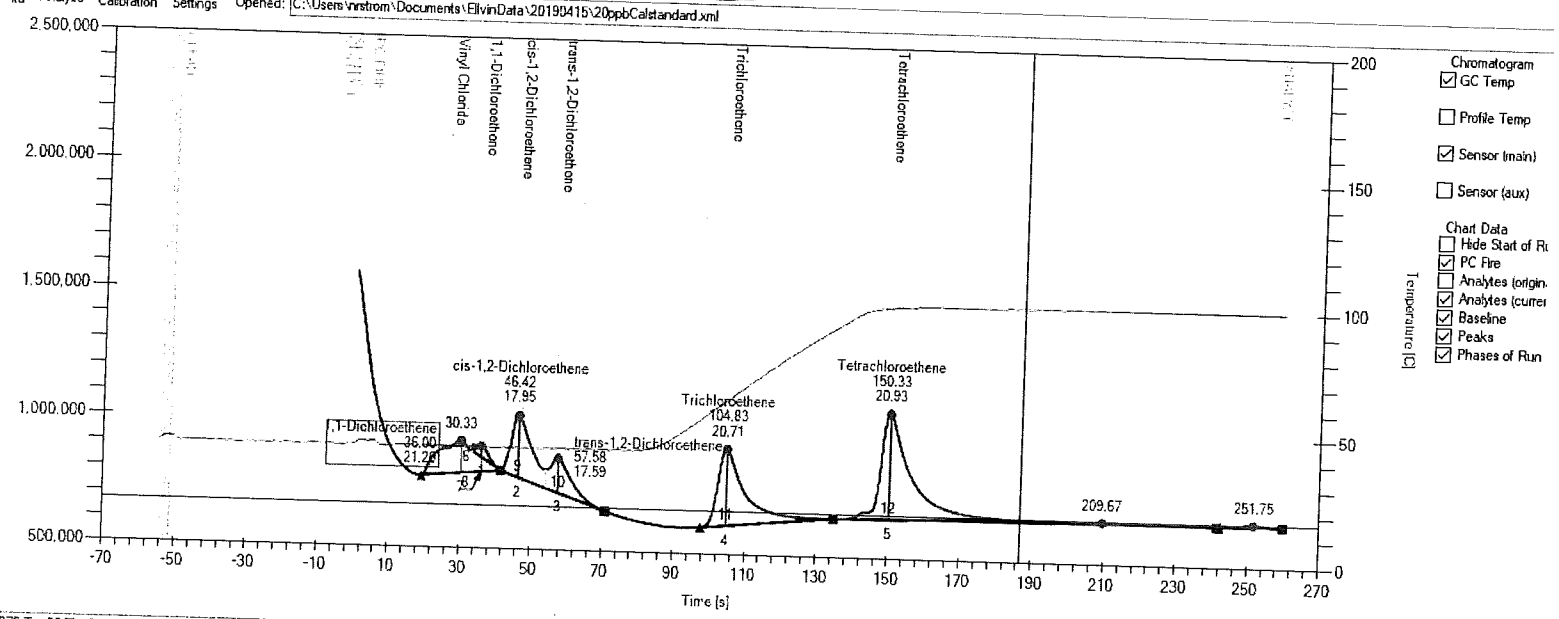

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dards at 20ppb

Dilution 1.0

Operations

Flatten Beta

Auto Analyze

View Report

Results

Analyte	Peak	Time	Height	Area	Concentration	Final Conc
1,1-Dichloroe...	1	36	44062	178931	21.20	21
cis-1,2-Dichlo...	2	46.42	244685	1650921	17.95	17
trans-1,2-Dic...	3	57.58	134747	956118	17.59	17
Trichloroethe...	4	104.83	300192	2698276	20.71	20
[illegible]	5	150.33	[illegible]	[illegible]	20.93	20

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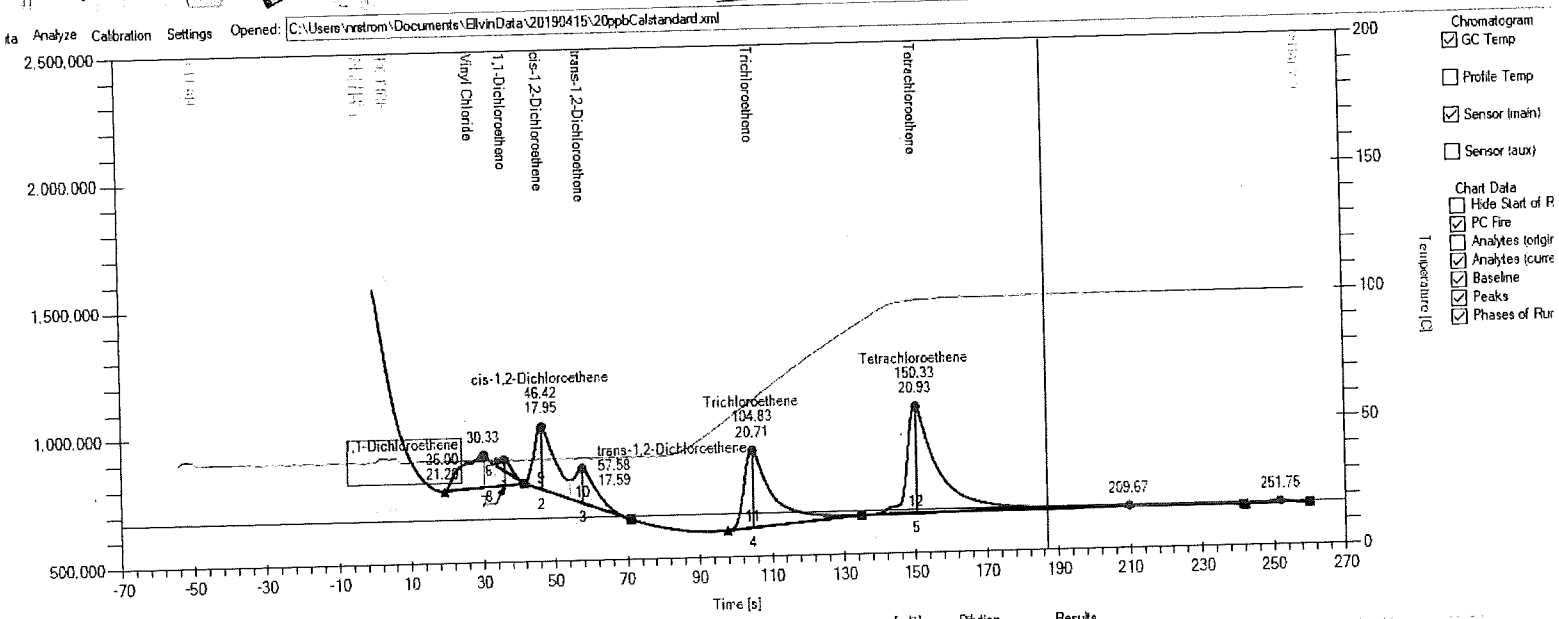

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ndards at 20ppb

Dilution 1.0

Operations

Flatten Beta

Auto Analyze

View Report

Results

Analyte	Peak	Time	Height	Area	Concentration	Final Co
1,1-Dichloroe...	1	36	44092	117893	21.20	
cis-1,2-Dichlo...	2	46.42	244685	1650921	17.95	
trans-1,2-Dic...	3	57.58	134747	956110	17.59	
Trichloroethe...	4	104.83	300192	2698276	20.71	
[illegible]	5	150.33	[illegible]	[illegible]	[illegible]	

ONNECTED ... X: 0.00 Y: 0 Y2: 0.00 ANALYZE: 0.0 0.0

7:53 AM

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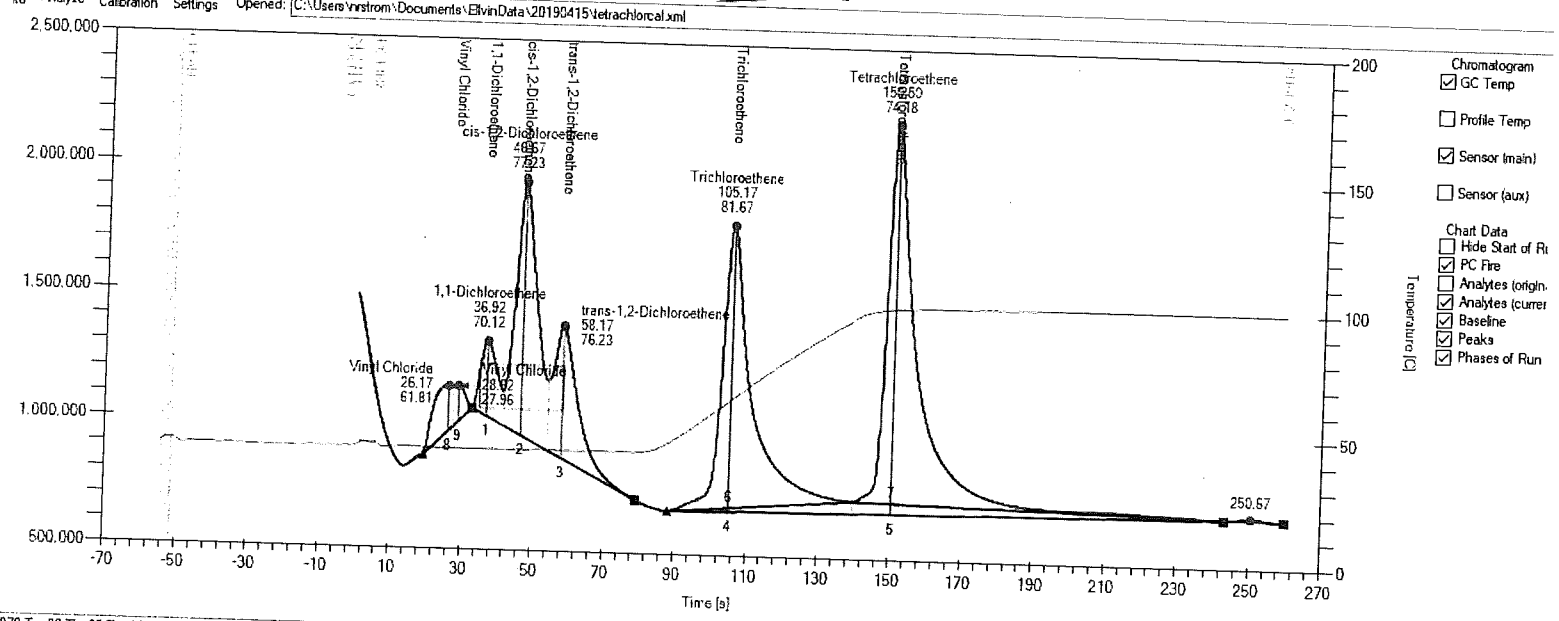

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dard 80ppb

Dilution 1.0

Operations Flatten Beta

Auto Analyze

View Report

Results

Analyte	Peak	Time	Height	Area	Concentration	Final Conc
1,1-Dichloroe...	1	36.92	296140	1659112	70.12	7
cis-1,2-Dichlo...	2	46.67	993780	7075995	77.23	77
trans-1,2-Dic...	3	58.17	521814	4141575	76.23	76
Trichloroethe...	4	105.17	1122819	11811264	81.67	81
Tetrachloroet...	5	150.5	1579173	16910741	74.19	74

NNECTED ... X: 0.00 Y: 0 Y2: 0.00 ANALYZE: 0.0 0.0

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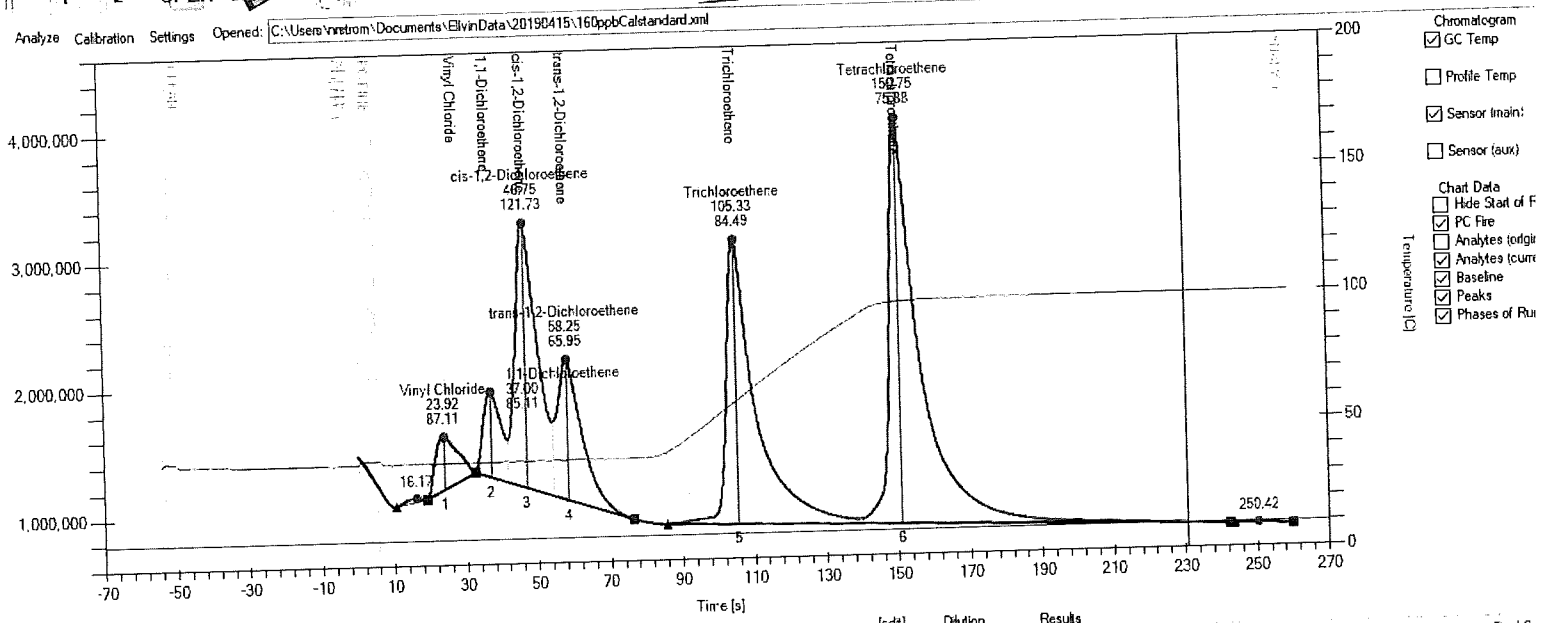
1 2 OPEN SAVE EXPORT PORT Select Defiant Technologies HELP

ta Analyze Calibration Settings Opened: C:\Users\nnstrom\Documents\ElvinData\20190415\160ppbCalstandard.xml



[edit]

0078:Ta=80,Tb=60,Tc=120,Ct=40,Ht=100,collect=45,clean=4,presettle=4,settle=2,fire=6

ndard 160 ppb

Dilution 1.0

Operations

Flatten Beta

Auto Analyze

View Report

Results

Analyte	Peak	Time	Height	Area	Concentration	Final Co
Vinyl Chloride	1	23.92	407617	2260898	87.11	
1,1-Dichloroe...	2	37	657706	3812533	85.11	
cis-1,2-Dichlo...	3	46.75	2072773	14742116	121.73	1
trans-1,2-Dic...	4	58.25	1099293	8728022	65.95	
Trichloroethe...	5	105.33	[illegible]	[illegible]	84.49	

ONNECTED ... X: 0.00 Y: 0 Y2: 0.00 ANALYZE: 0.0 0.0

7:54 AM

Ellvin GC Software

1 2 OPEN SAVE EXPORT PORT Select Por ▾ Defiant Technologies HELP ▾

Live Data Analyze Calibration Settings

Calibration File

C:\Users\nrstrom\Documents\ElvinData\testcal.ana

Analytes

- Vinyl Chloride
- 1,1-Dichloroethene
- cis-1,2-Dichloroethene
- trans-1,2-Dichloroethene
- Trichloroethene
- Tetrachloroethene

Properties

Alias: PCE | Retention Time: avg= 150.63 s | Time Window: 5.00 s | Chemical:

Peak	Time	Height	Area	Concentration	FileName
7	150.75	3172052	31066770	160	C:\Users\nrstrom\Documents\ElvinData\20190415\1152_LOG_804.xml
8	150.33	415132	4064153	20	C:\Users\nrstrom\Documents\ElvinData\20190415\1109_LOG_799.xml
9	151.08	77252	640613	4	C:\Users\nrstrom\Documents\ElvinData\20190415\1127_LOG_801.xml
10	150.5	722852	6840554	40	C:\Users\nrstrom\Documents\ElvinData\20190415\1135_LOG_802.xml
11	150.5	1485532	14324221	80	C:\Users\nrstrom\Documents\ElvinData\20190415\1144_LOG_803.xml

Curve Fit Options

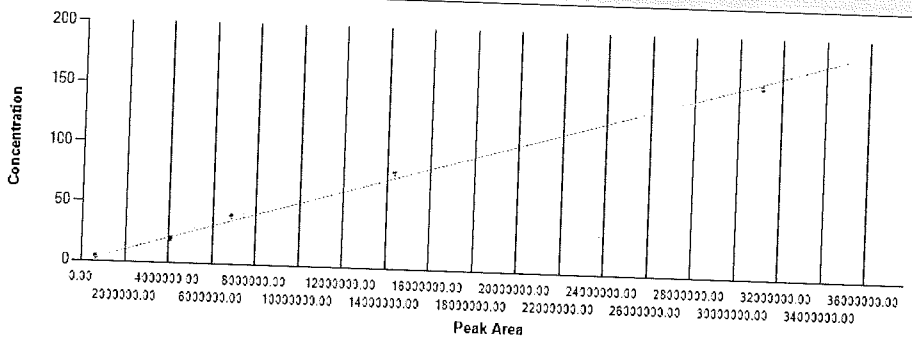
Area | Linear

☑ Force Through Zero

Curve Fit Results

Linear Fn.	y = 5.2462E-06 x + 0
Linear R²	0.99668
Quadratic	y = -2.2265E-14 x² + 5.8472E-06 x + 0
Quad R²	0.99914

DOWNLOAD CALIBRATION TO DEVICE



Calibration on instrument [set ...]

... X: 32.78 Y: 1054412 Y2: 55.4412 ANALYZE: 32.78 0.0

3:21 PM 4/15/2019

Ellvin GC Software

1 2 OPEN SAVE EXPORT PORT Select Por

Defant Technologies HELP

Live Data Analyze Calibration Settings

Calibration File

C:\Users\nrstrom\Documents\ElvinData\testcal.ana

Analytes

- Vinyl Chloride
- 1,1-Dichloroethene
- cis-1,2-Dichloroethene
- trans-1,2-Dichloroethene
- Trichloroethene
- Tetrachloroethene

Properties

Alias: TCE

Retention Time: avg= 105.25 s

Time Window: 5.00 s

Chemical:

Peak	Time	Height	Area	Concentration	FileName
7	105.33	2224208	20869333	160	C:\Users\nrstrom\Documents\ElvinData\20190415\1152_LOG_004.xml
8	104.83	300214	2701880	20	C:\Users\nrstrom\Documents\ElvinData\20190415\1109_LOG_759.xml
9	105.5	53439	385805	4	C:\Users\nrstrom\Documents\ElvinData\20190415\1127_LOG_001.xml
10	105.42	526956	4759875	40	C:\Users\nrstrom\Documents\ElvinData\20190415\1135_LOG_002.xml
12	105.17	1107557	10607485	80	C:\Users\nrstrom\Documents\ElvinData\20190415\1144_LOG_003.xml

Calibration on instrument Set

Curve Fit Options

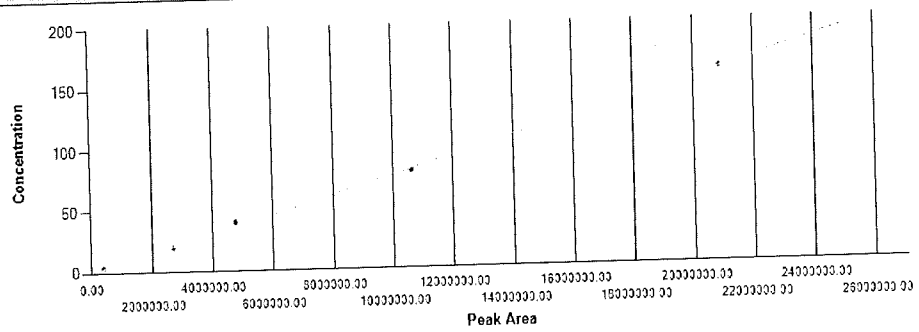
Area Linear

☑ Force Through Zero

Curve Fit Results

Linear Fn:	y = 7.6687E-06 x + 0
Linear R²:	0.99899
Quadratic:	y = -6.1239E-15 x² + 7.7789E-06 x + 0
Quad R²:	0.99903

DOWNLOAD CALIBRATION TO DEVICE



... X: 32.78 Y: 1054412 Y2: 55.4412 ANALYZE: 32.78 0.0

3:22 PM 4/15/2019

Ellvin GC Software

1 2 OPEN SAVE EXPORT PORT Select Por HELP

Live Data Analyze Calibration Settings

Calibration File

C:\Users\nrstrom\Documents\EllvinData\testcal.ana

Analytes

- Vinyl Chloride
- 1,1-Dichloroethene
- cis-1,2-Dichloroethene
- [illegible]
- Trichloroethene
- Tetrachloroethene

Properties

Alias: T12d

Retention Time: avg= 58.12 s

Time Window: 5.00 s

Chemical:

Peak	Time	Height	Area	Concentration	FileName
7	58.25	1099293	8728022	160	C:\Users\nrstrom\Documents\EllvinData\20190415\1152_LOG_804.xml
8	57.50	134960	959375	20	C:\Users\nrstrom\Documents\EllvinData\20190415\1109_LOG_799.xml
9	58.17	12881	49155	4	C:\Users\nrstrom\Documents\EllvinData\20190415\1127_LOG_801.xml
10	58.42	259228	2088558	40	C:\Users\nrstrom\Documents\EllvinData\20190415\1135_LOG_802.xml
11	58.17	521814	4141575	80	C:\Users\nrstrom\Documents\EllvinData\20190415\1144_LOG_803.xml

Curve Fit Options

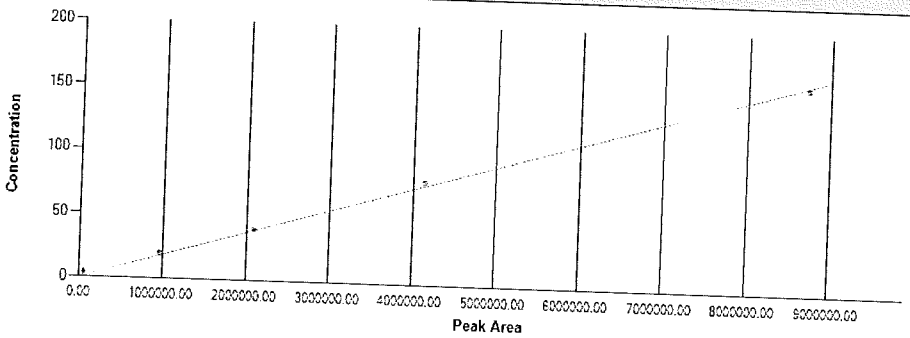
Area Linear

☑ Force Through Zero

Curve Fit Results

Linear Fn:	y = 1.8564E-05 x + 0
Linear R²:	0.99809
Quadratic:	y = -1.9744E-13 x² + 2.0058E-05 x + 0
Quad R²:	0.99928

DOWNLOAD CALIBRATION TO DEVICE



Calibration on instrument [set ...]

... X: 32.78 Y: 1054412 Y2: 55.4412 ANALYZE: 32.78 0.0

3:22 PM 4/15/2019

1 2 OPEN SAVE EXPORT PORT Select Por

Defiant Technologies HELP

ta Analyze Calibration Settings

tion File

s\nrstrom\Documents\ElvinData\testcal.ana

Properties

Alias: C12DC | Retention Time: avg= 46.60 s | Time Window: 5.00 s | Chemical:

- loride
- hloroethene
- Tetrachloroethene
- 2-Dichloroethene
- ethene
- loroethene

Peak	Time	Height	Area	Concentration	FileName
7	46.75	2072773	14742116	160	C:\Users\nrstrom\Documents\ElvinData\20190415\1152_LOG_804.xml
8	46.42	244945	1654152	20	C:\Users\nrstrom\Documents\ElvinData\20190415\1109_LOG_799.xml
9	46.25	32394	162468	4	C:\Users\nrstrom\Documents\ElvinData\20190415\1127_LOG_801.xml
10	46.92	476070	3402626	40	C:\Users\nrstrom\Documents\ElvinData\20190415\1135_LOG_802.xml
11	46.67	993780	7075995	80	C:\Users\nrstrom\Documents\ElvinData\20190415\1144_LOG_803.xml

Calibration on instrument

Fit Options

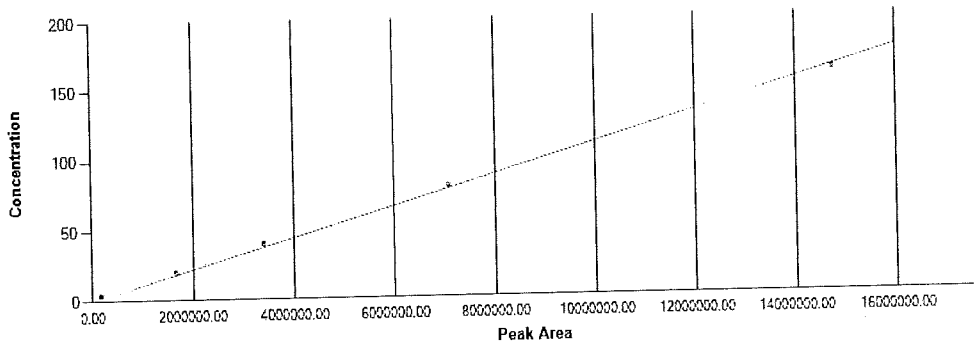
Linear

rce Through Zero

Fit Results

r Fn:	y = 1.0984E-05 x + 0
r R²	0.99845
ratic:	y = -7.0471E-14 x² + 1.1885E-05 x + 0
R²:	0.99967

NLOAD CALIBRATION TO DEVICE



X: 32.78 Y: 1054412 Y2: 55.4412 ANALYZE: 32.78 0.0

3:22 PM

1 2 OPEN SAVE EXPORT PORT Select Por ▾ Defiant Technologies HELP ▾

ta Analyze Calibration Settings

ition File

s\nrstrom\Documents\EllvinData\testcal.ana

Properties

Alias: 11DCE | Retention Time: avg= 36.68 s | Time Window: 5.00 s | Chemical:

loride
Dichloroethene
2-Dichloroethene
oethene
loroethene

Peak	Time	Height	Area	Concentration	File Name
7	37	667706	3812533	160	C:\Users\nrstrom\Documents\EllvinData\20190415\1152_LOG_804.xml
8	36	100658	505110	20	C:\Users\nrstrom\Documents\EllvinData\20190415\1109_LOG_799.xml
9	37	144315	800144	40	C:\Users\nrstrom\Documents\EllvinData\20190415\1135_LOG_802.xml
10	36.5	7259	19898	4	C:\Users\nrstrom\Documents\EllvinData\20190415\4ppbCalstandard.xml
11	36.92	296140	1659112	80	C:\Users\nrstrom\Documents\EllvinData\20190415\1144_LOG_803.xml

Fit Options

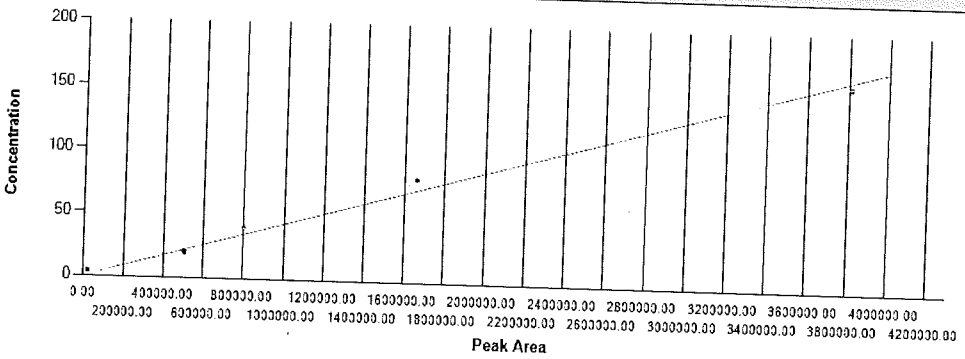
Linear

rce Through Zero

Fit Results

Fn:	y = 4.3166E-05 x + 0
R²:	0.99137
atic:	y = -2.3442E-12 x² + 5.0982E-05 x + 0
R²:	0.99745

LOAD CALIBRATION TO DEVICE



Calibration on instrument

... X: 32.78 Y: 1054412 Y2: 55.4412 ANALYZE: 32.78 0.0

3:22 PM

1 2 OPEN SAVE EXPORT PORT Select Por Defiant Technologies HELP

ta Analyze Calibration Settings

tion File

s\nrstrom\Documents\ElvinData\testcal.ana

es

Properties

Alias: VC | Retention Time: avg= 25.05 s | Time Window: 10.00 s | Chemical:

lorides

lorethene

Dichloroethene

2-Dichloroethene

ethene

loroethene

Peak	Time	Height	Area	Concentration	FileName
7	23.92	407617	2960898	160	C:\Users\nrstrom\Documents\ElvinData\20190415\1152_LOG_804.xml
8	26.17	177945	1143805	80	C:\Users\nrstrom\Documents\ElvinData\20190415\1144_LOG_803.xml

Calibration on instrument

Fit Options

Linear

rce Through Zero

Fit Results

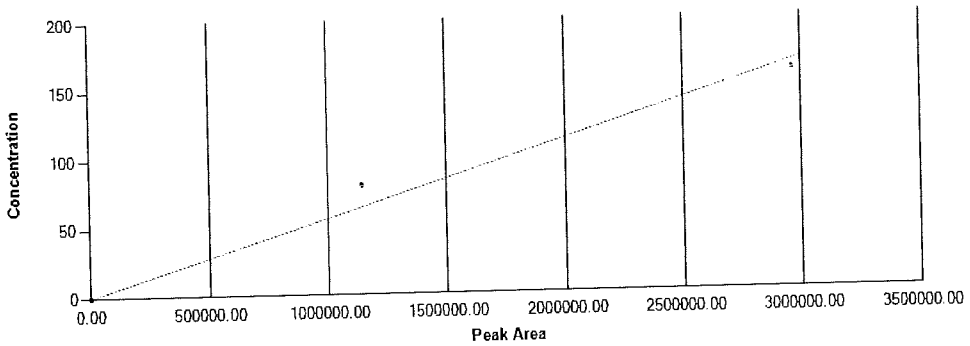
r Fn: y = 5.6103E-05 x + 0

r R²: 0.91001

ratic: y = -8.7526E-12 x² + 7.5953E-05 x + 0

R²: 1.00000

NLOAD CALIBRATION TO DEVICE



X: 32.78 Y: 1054412 Y2: 55.4412 ANALYZE: 32.78 0.0

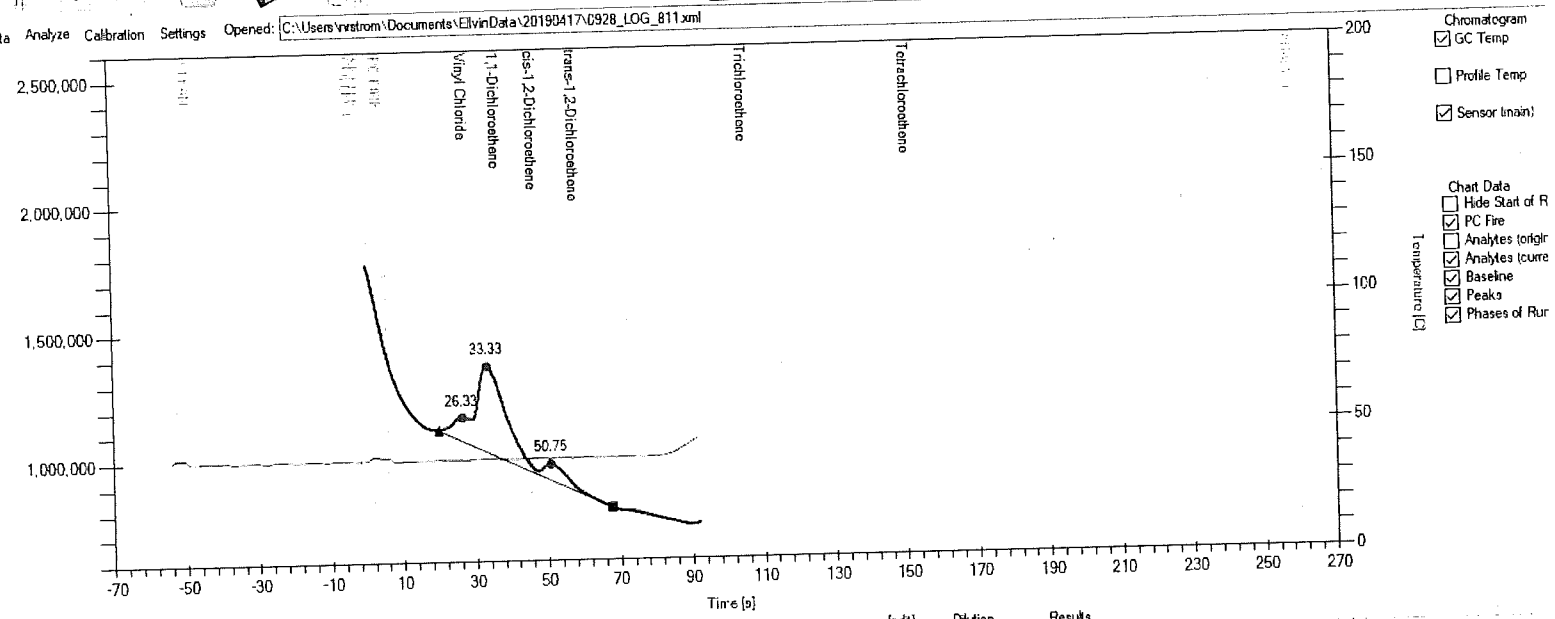
3:22 PM

Mobile GC Data
Site Inspection Investigation
Camdenton Treatment Plant
Lagoon Site

April 17, 2019

1 2 OPEN SAVE EXPORT PORT Select Defiant Technologies HELP

ta Analyze Calibration Settings Opened: C:\Users\nrstrom\Documents\ElvinData\20190417\0928_LOG_811.xml



[edit] Dilution 1.0

Operations
Flatten Beta
Auto Analyze
View Report

Results

Analyte	Peak	Time	Height	Area	Concentration	Final Co

0078:Ta=80, Tb=60, Tc=120, Ct=40, Ht=100, collect=45, clean=4, presettle=4, settle=2, fire=6

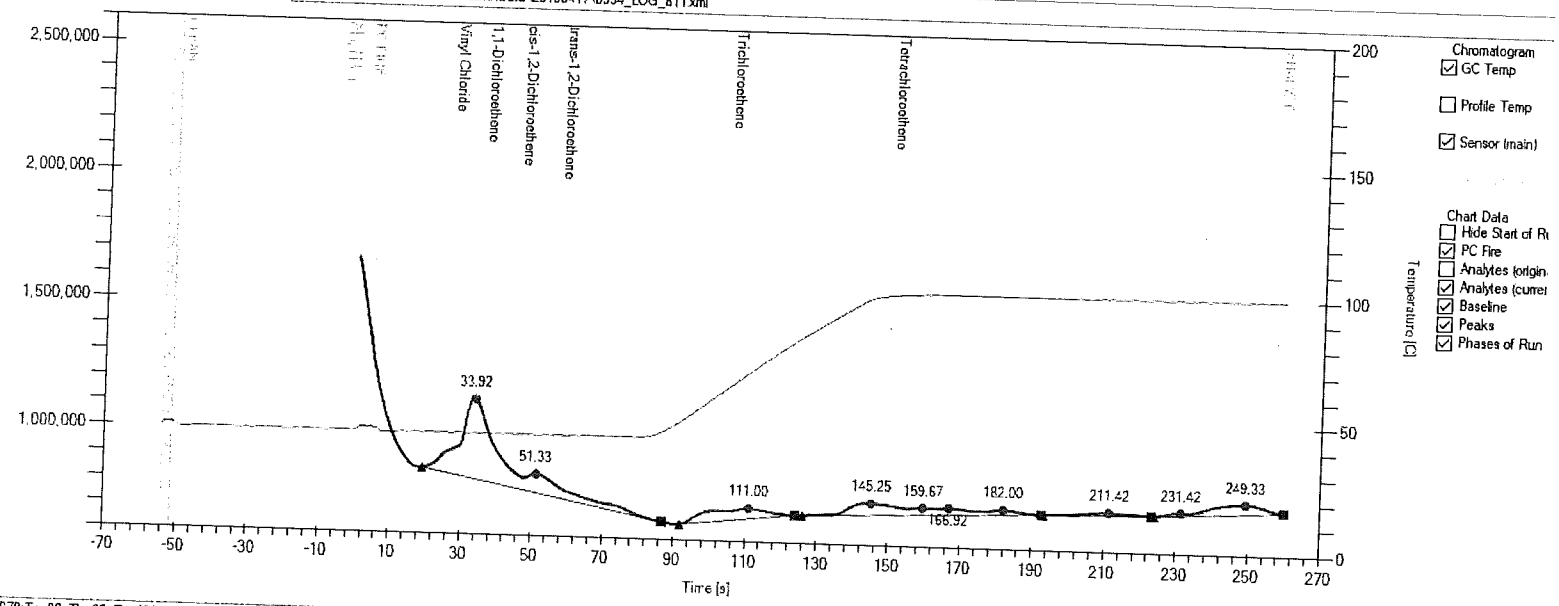
ANCELED!

ONNECTED ... X: 0.00 Y: 0 Y2: 0.00 ANALYZE: 0.0 0.0

7:36 AM

1 2 OPEN SAVE EXPORT PORT Select Defiant Technologies HELP

ta Analyze Calibration Settings Opened: C:\Users\nrstrom\Documents\ElvinData\20190417\0934_LOG_811.xml



0:78:Ta=80, Tb=60, Tc=120, Ct=40, Ht=100, collect=45, clean=4, presettle=4, settle=2, fire=6 [edit]

Blank #2

Dilution 1.0

Operations

Flatten Beta

Auto Analyze

View Report

Results

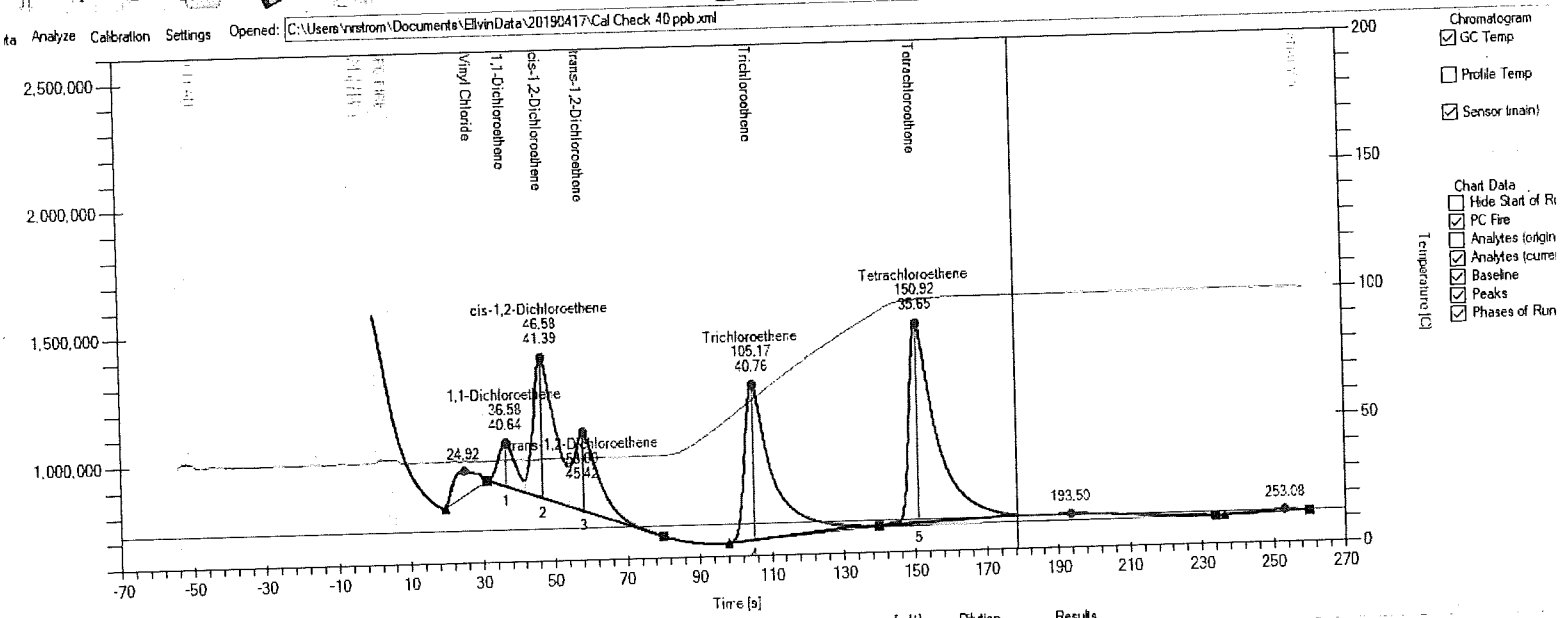
Analyte	Peak	Time	Height	Area	Concentration	Final Conc

NNECTED ... X: 0.00 Y: 0 Y2: 0.00 ANALYZE: 0.0 0.0

7:39 AM

1 2 OPEN SAVE EXPORT PORT Select Defiant Technologies HELP

Analyze Calibration Settings Opened: C:\Users\nrstrom\Documents\ElvinData\20190417\Cal Check 40 ppb.xml



[edit]

0078:Ta=80,Tb=60,Tc=120,Ct=40,Ht=100,collect=45,clean=4,presettle=4,settle=2,fire=6

ion Check Sample 40 ppb

Dilution 1.0

Operations
Flatten Beta
Auto Analyze
View Report

Results

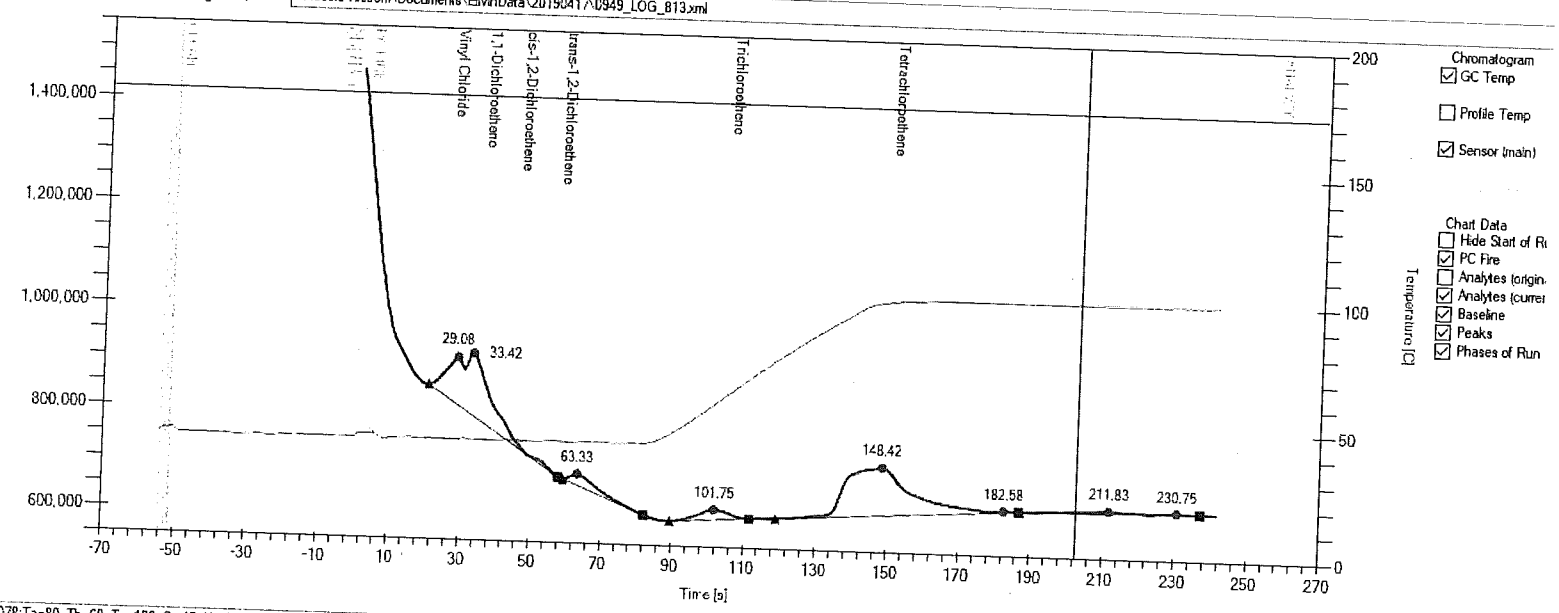
Analyte	Peak	Time	Height	Area	Concentration	Final Co
1,1-Dichloroe...	1	36.58	169523	941195	40.64	
cis-1,2-Dichlo...	2	46.58	548198	3768238	41.39	
trans-1,2-Dic...	3	58	307423	2446755	45.42	
Trichloroethe...	4	105.17	605192	5315506	40.76	
[illegible]	5	150.92	[illegible]	[illegible]	35.65	

ONNECTED ... X: 0.00 Y: 0 Y2: 0.00 ANALYZE: 0.0 0.0

7:39 AM

1 2 OPEN SAVE EXPORT PORT Select Defiant Technologies HELP

ta Analyze Calibration Settings Opened: C:\Users\nrstrom\Documents\ElvinData\20190417\0949_LOG_813.xml



078:Ta=80, Tb=60, Tc=120, Ct=40, Ht=100, collect=45, clean=4, presettle=4, settle=2, fire=6 [edit]

Blank #2
NCELED!

Dilution 1.0

Operations
Flatten Beta
Auto Analyze
View Report

Results

Analyte	Peak	Time	Height	Area	Concentration	Final Conc

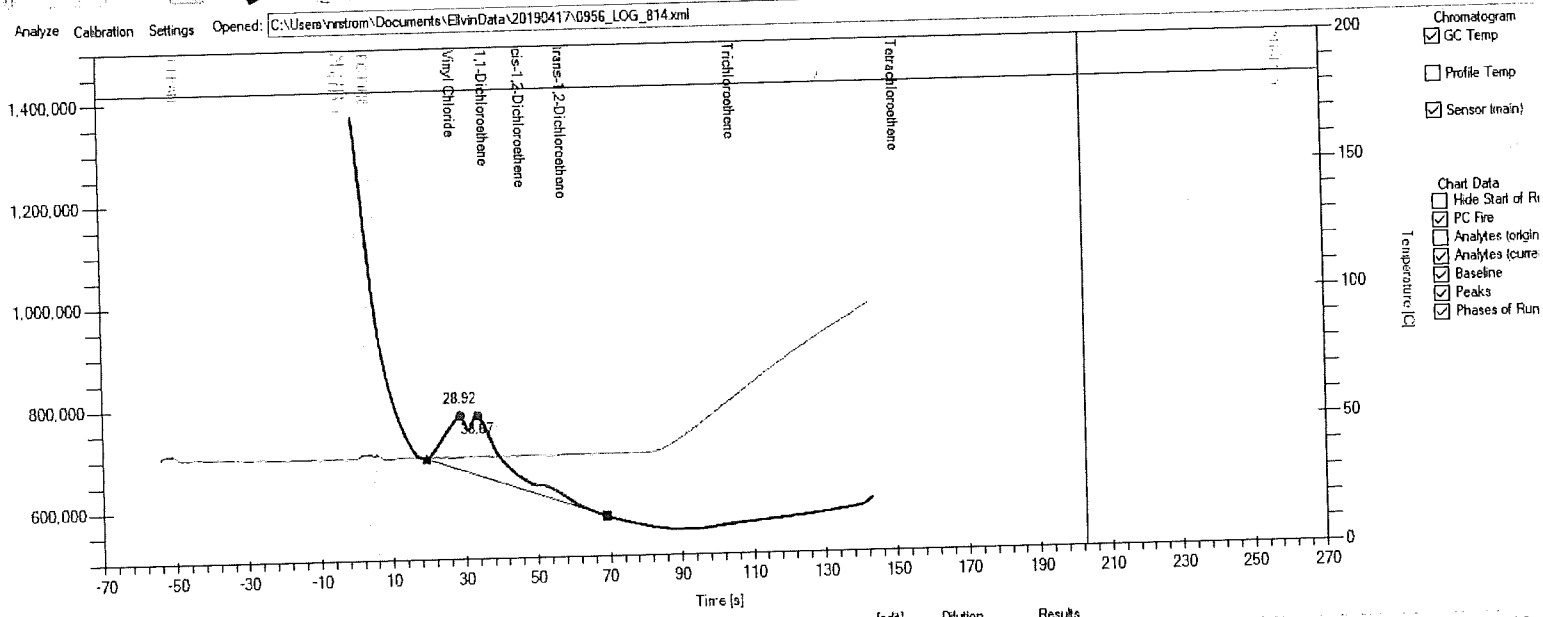
NECTED ... X: 0.00 Y: 0 Y2: 0.00 ANALYZE: 0.0 0.0

7:40 AM

1 2 OPEN SAVE EXPORT PORT Select HELP

Defiant Technologies

ta Analyze Calibration Settings Opened: C:\Users\nrstrom\Documents\ElvinData\20190417\0956_LOG_814.xml



[edit]

0078:Ta=80, Tb=60, Tc=120, Ct=40, Ht=100, collect=45, clean=4, presettle=4, settle=2, fire=6

l Blank #3
ANCELED!

Dilution 1.0

Operations
Ratten Beta

Auto Analyze
View Report

Results

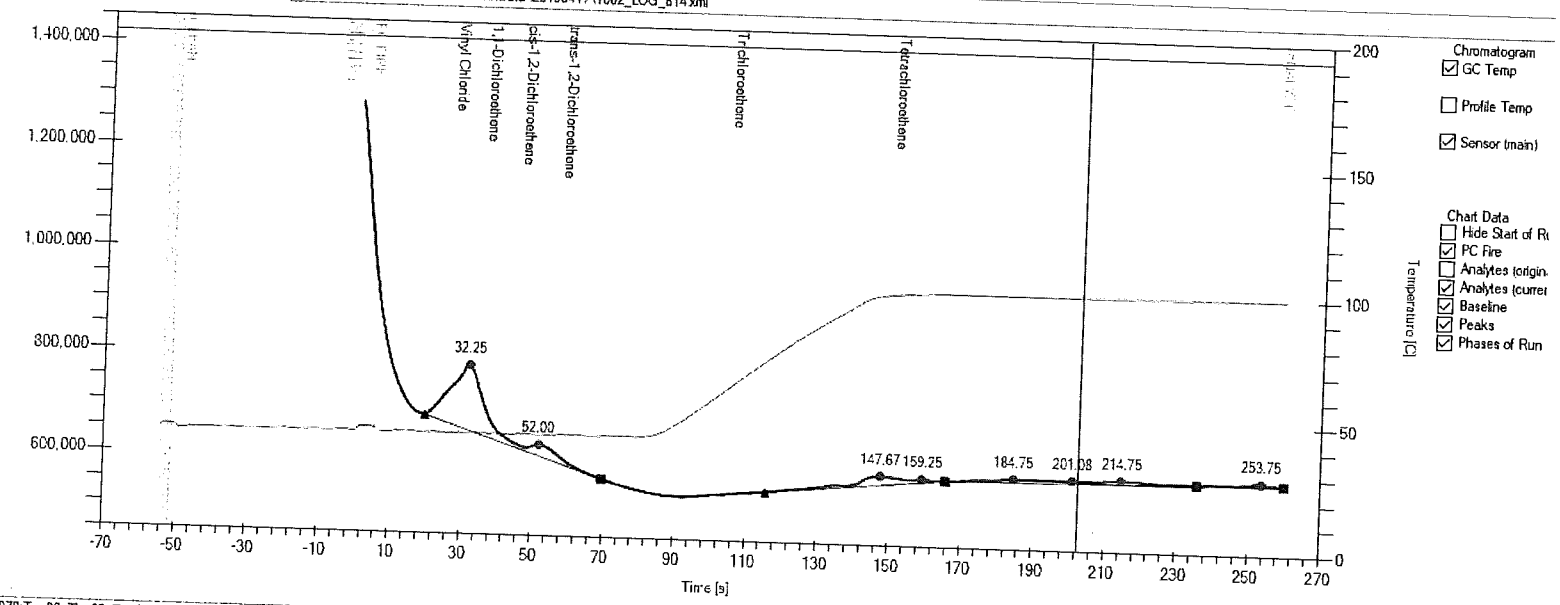
Analyte	Peak	Time	Height	Area	Concentration	Final Co

ONNECTED ... X: 0.00 Y: 0 Y2: 0.00 ANALYZE: 0.0 0.0

7:40 AM

1 2 OPEN SAVE EXPORT PORT Select Defiant Technologies HELP

ta Analyze Calibration Settings Opened: C:\Users\nrstrom\Documents\ElvinData\20190417\1002_LOG_814.xml



078:Ta=80, Tb=60, Tc=120, Ct=40, Ht=100, collect=45, clean=4, presettle=4, settle=2, fire=6 [edit]

to 8' Undiluted

Dilution 1.0

Operations

Flatten Beta

Auto Analyze

View Report

Results

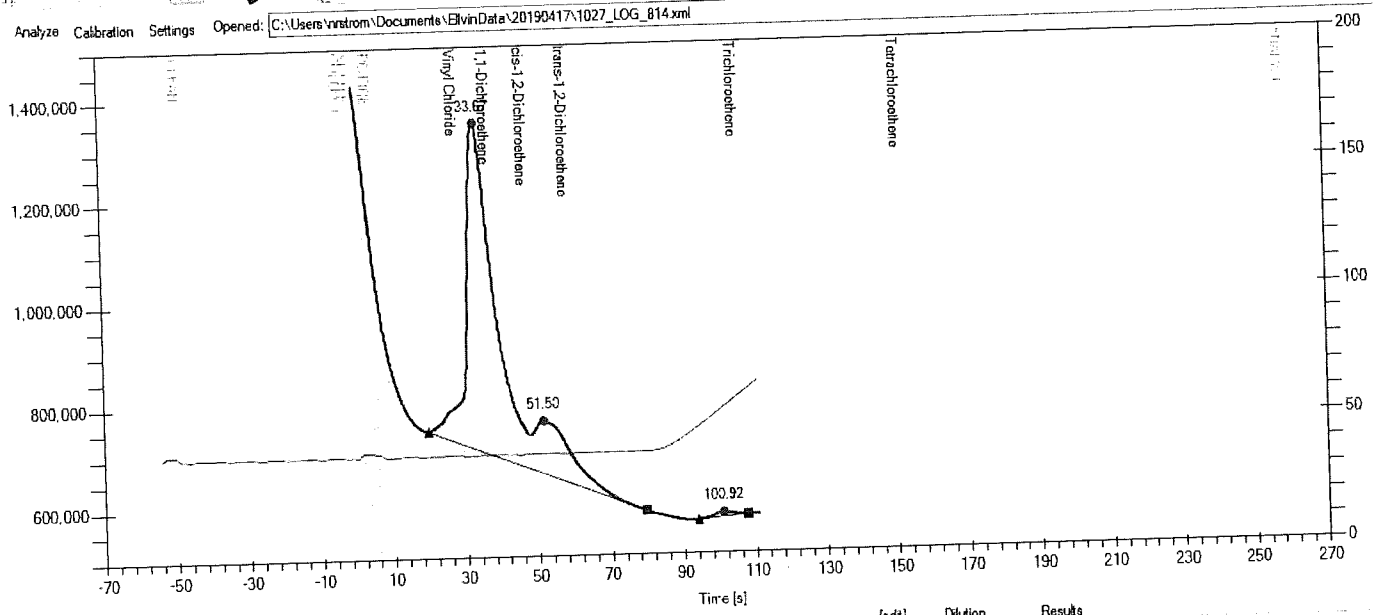
Analyte	Peak	Time	Height	Area	Concentration	Final Conc

NECTED ... X: 0.00 Y: 0 Y2: 0.00 ANALYZE: 0.0 0.0

7:40 AM

1 2 OPEN SAVE EXPORT PORT Select Defiant Technologies HELP

ta Analyze Calibration Settings Opened: C:\Users\nnstrom\Documents\ElvinData\20190417\1027_LOG_814.xml



Chromatogram
- [x] GC Temp
- [ ] Profile Temp
- [x] Sensor (main)

Chart Data
- [ ] Hide Start of F
- [x] PC Fire
- [ ] Analytes (origi
- [x] Analytes (curre
- [x] Baseline
- [x] Peaks
- [x] Phases of Ru

[edit] Dilution 1.0

Results

Analyte	Peak	Time	Height	Area	Concentration	Final C

0078:Ta=80, Tb=60, Tc=120, Ct=40, Ht=100, collect=45, clean=4, presettle=4, settle=2, fire=6

4' to 8' Undiluted
ANCELED!

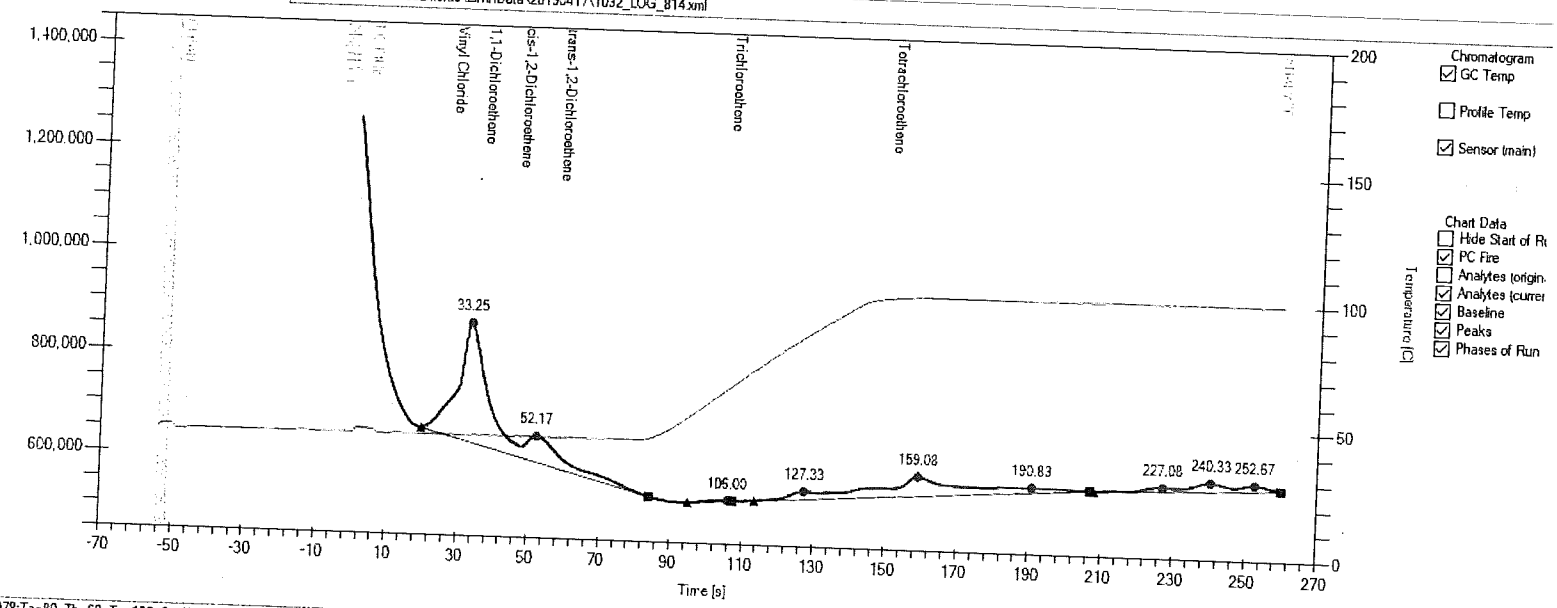
Operations
Flatten Beta
Auto Analyze
View Report

ONNECTED ... X: 0.00 Y: 0 Y2: 0.00 ANALYZE: 0.0 0.0

7:41 AM

1 2 OPEN SAVE EXPORT PORT Select Defiant Technologies HELP

ta Analyze Calibration Settings Opened: C:\Users\nrstrom\Documents\ElvinData\20190417\1032_LOG_814.xml



78:Ta=80, Tb=60, Tc=120, Ct=40, Ht=100, collect=45, clean=4, presettle=4, settle=2, fire=6 [edit]

o 8' Undiluted Run #2

Dilution 1.0

Operations

Flatten Beta

Auto Analyze

View Report

Results

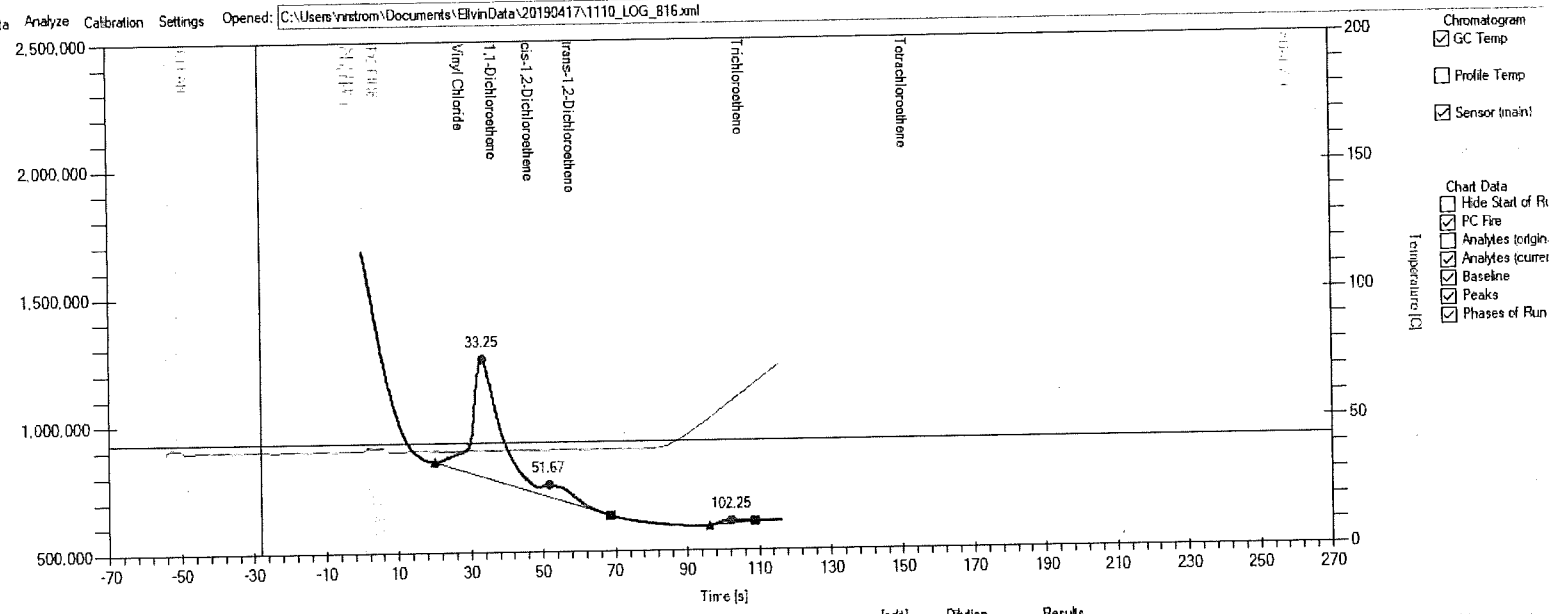
Analyte	Peak	Time	Height	Area	Concentration	Final Conc

NECTED ... X: 0.00 Y: 0 Y2: 0.00 ANALYZE: 0.0 0.0

7:41 AM

1 2 OPEN SAVE EXPORT PORT Select Defiant Technologies HELP

ta Analyze Calibration Settings Opened: C:\Users\nnstrom\Documents\ElvinData\20190417\1110_LOG_816.xml



[edit]

0078:Ta=80, Tb=60, Tc=120, Ct=40, Ht=100, collect=45, clean=4, presettle=4, settle=2, fire=6

4' to 8' Undiluted

ANCELED!

Dilution 1.0

Operations

Flatten Beta

Auto Analyze

View Report

Results

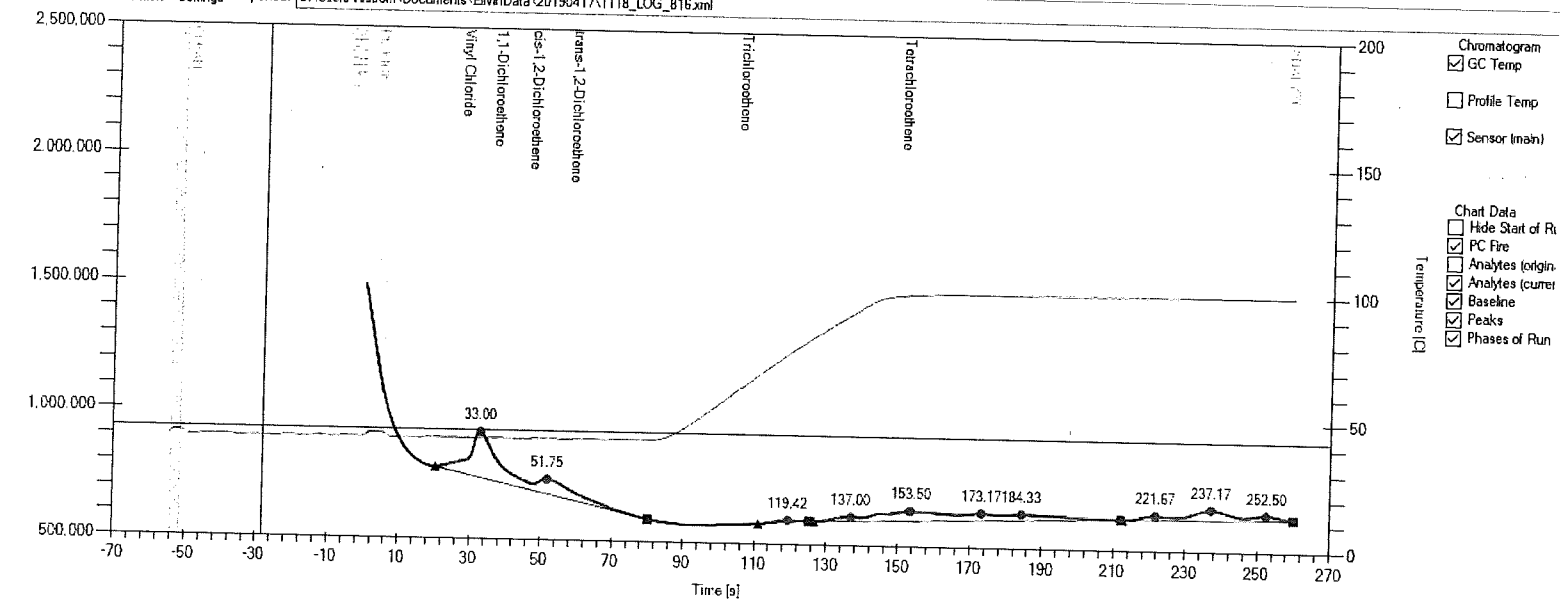
Analyte	Peak	Time	Height	Area	Concentration	Final Conc

ONNECTED ... X: 0.00 Y: 0 Y2: 0.00 ANALYZE: 0.0 0.0

7:42 AM

1 2 OPEN SAVE EXPORT PORT Select Defiant Technologies HELP

ta Analyze Calibration Settings Opened: C:\Users\nwstrom\Documents\ElvinData\20190417\1118_LOG_816.xml



0078:Ta=80, Tb=60, Tc=120, Ct=40, Ht=100, collect=45, clean=4, presettle=4, settle=2, fire=6 [edit]

4' to 8' Undiluted run #2

Dilution 1.0

Operations

Ratten Beta

Auto Analyze

View Report

Results

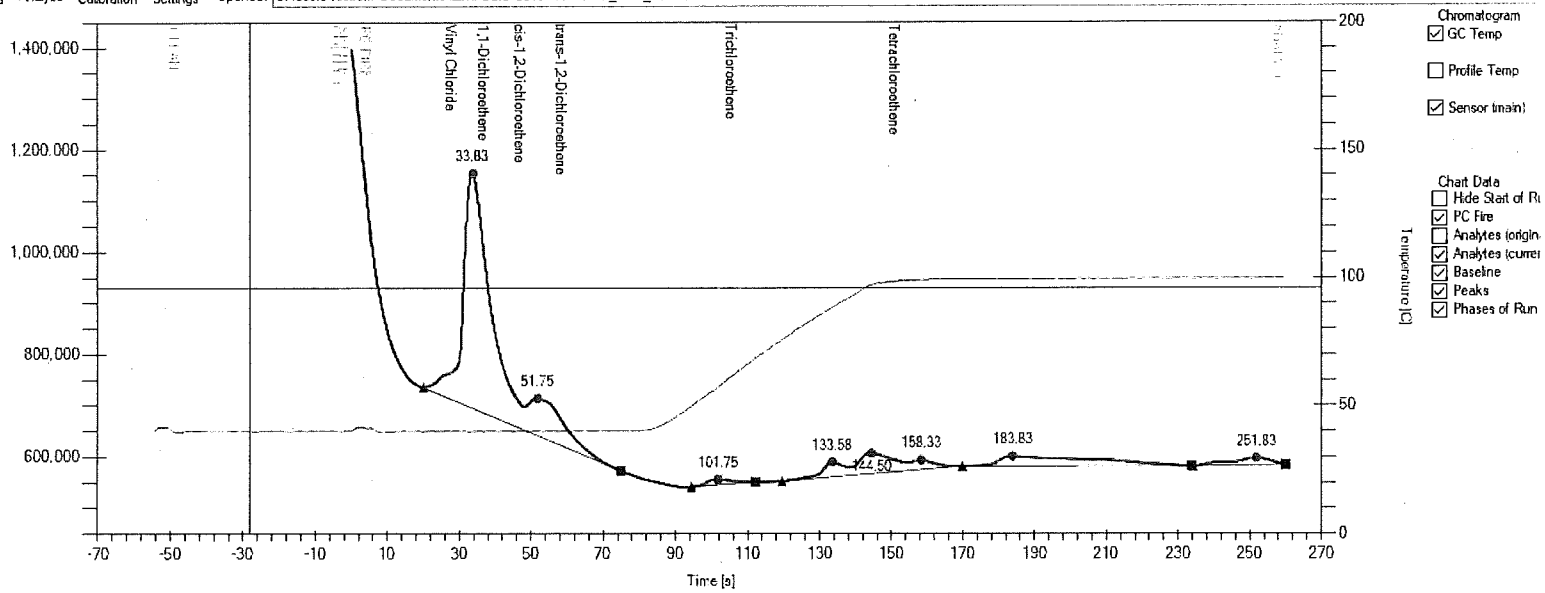
Analyte	Peak	Time	Height	Area	Concentration	Final Conc

ONNECTED ... X: 0.00 Y: 0 Y2: 0.00 ANALYZE: 0.0 0.0

7:42 AM

1 2 OPEN SAVE EXPORT PORT Select Defiant Technologies HELP

ta Analyze Calibration Settings Opened: C:\Users\rnstrom\Documents\EllvinData\20190417\1202_LOG_817.xml



[edit] Dilution 1.0

0078:Ta=80, Tb=60, Tc=120, Ct=40, Ht=100, collect=45, clean=4, presettle=4, settle=2, fire=6

4' to 8' Undiluted run #2

Operations
Flatten Beta
Auto Analyze
View Report

Results

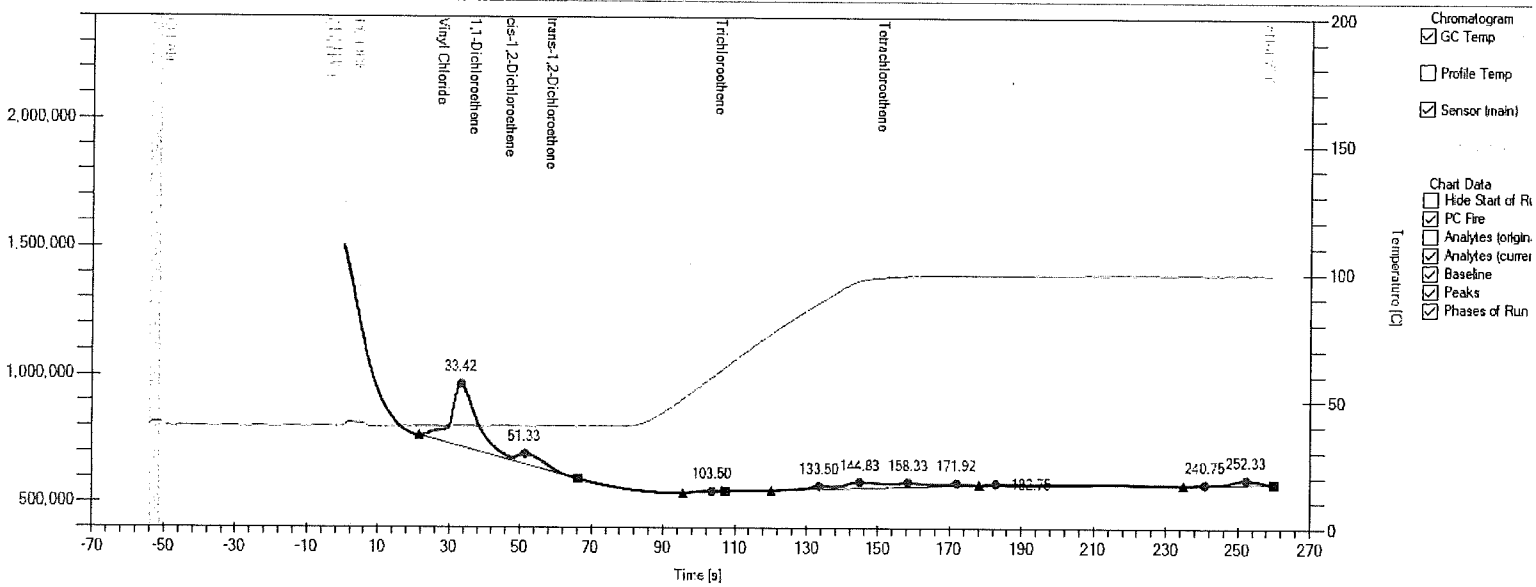
Analyte	Peak	Time	Height	Area	Concentration	Final Conc

ONNECTED ... X: 0.00 Y: 0 Y2: 0.00 ANALYZE: 0.0 0.0

7:42 AM

1 2 OPEN SAVE EXPORT PORT Select Defiant Technologies HELP

ta Analyze Calibration Settings Opened: C:\Users\nrstrom\Documents\ElvinData\20190417\1228_LOG_818.xml



[edit]

0078:Ta=80, Tb=60, Tc=120, Ct=40, Ht=100, collect=45, clean=4, presettle=4, settle=2, fire=6

11.4' to 15.4' Undiluted

Dilution 1.0

Operations

Flatten Beta

Auto Analyze

View Report

Results

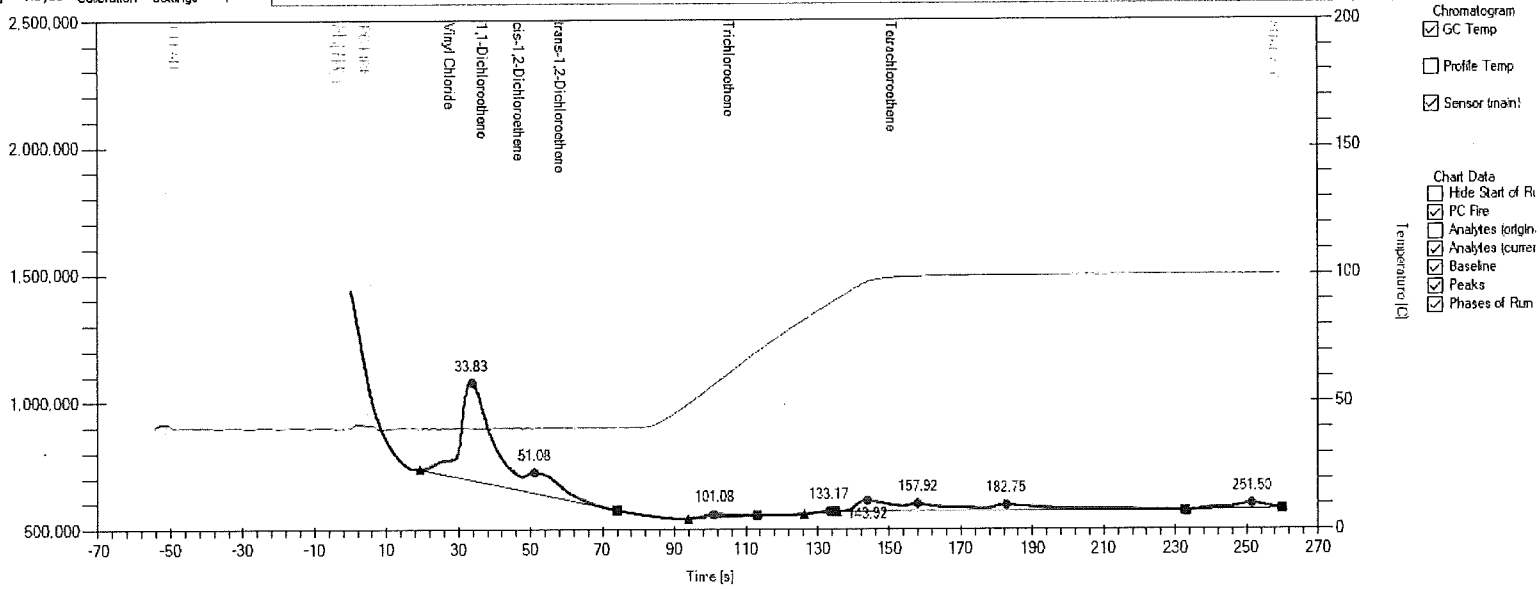
Analyte	Peak	Time	Height	Area	Concentration	Final Conc

ONNECTED ... X: 0.00 Y: 0 Y2: 0.00 ANALYZE: 0.0 0.0

7:43 AM

1 2 OPEN SAVE EXPORT PORT Select Defiant Technologies HELP

ta Analyze Calibration Settings Opened: C:\Users\nrstrom\Documents\ElvinData\20190417\1323_LOG_819.xml



[edit]

0078:Ta=80, Tb=60, Tc=120, Ct=40, Ht=100, collect=45, clean=4, presettle=4, settle=2, fire=6

13.4' - 17.4' Undiluted

Dilution 1.0

Operations

Flatten Beta

Auto Analyze

View Report

Results

Analyte	Peak	Time	Height	Area	Concentration	Final Conc

ONNECTED ... X: 0.00 Y: 0 Y2: 0.00 ANALYZE: 0.0 0.0

7:43 AM

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1/3/2019
Mr. Ken Hannon
Missouri Dept. of Natural Resources
2710 West Main

Jefferson City MO 65109

Project Name: Camdenton Treatment Plant Lagoon
Project #: NJ18CTPL
Workorder #: 1812594

Dear Mr. Ken Hannon

The following report includes the data for the above referenced project for sample(s) received on 12/27/2018 at Air Toxics Ltd.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Brian Whittaker at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Brian Whittaker

Brian Whittaker
Project Manager

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WORK ORDER #: 1812594

Work Order Summary

CLIENT:	Mr. Ken Hannon Missouri Dept. of Natural Resources 2710 West Main Jefferson City, MO 65109	**BILL TO:**	Accounts Payable Missouri Dept. of Natural Resources P.O Box 176 Jefferson City, MO 65102
PHONE:	573-526-3363	**P.O. #**	NJ18CTPL
FAX:	573-526-3350	**PROJECT #**	NJ18CTPL Camdenton Treatment Plant Lagoon
DATE RECEIVED:	12/27/2018	**CONTACT:**	Brian Whittaker
DATE COMPLETED:	01/03/2019		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	184802-SG-01-05 West Side	TO-15	0.1 psi	15.1 psi
02A	184803-SG-01-10 West Side	TO-15	1.4 "Hg	15.1 psi
03A	184804-SG-02-05 South Side	TO-15	0 psi	15.1 psi
04A	184805-SG-02-10 South Side	TO-15	1.6 "Hg	15.2 psi
05A	184806-SG-03-05 East Side	TO-15	2 "Hg	15.1 psi
06A	184807-SG-03-10 East Side	TO-15	0.6 "Hg	15.1 psi
07A	184808-SG-04-05 North Side	TO-15	2 "Hg	14.9 psi
08A	184809-SG-04-10 North Side	TO-15	0.2 "Hg	15.1 psi
09A	184810 Ambient Air	TO-15	1.2 "Hg	15 psi
10A	Lab Blank	TO-15	NA	NA
11A	CCV	TO-15	NA	NA
12A	LCS	TO-15	NA	NA
12AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes

Technical Director

DATE: 01/03/19

Certification numbers: AZ Licensure AZ0775, FL NELAP - E8 , LA NELAP - 02089, NH NELAP - 209218, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-18-13, UT NELAP CA009332018-10, VA NELAP - 9505, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-011, Effective date: 10/18/2018, Expiration date: 10/17/2019.
Eurofins Air Toxics LLC. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
EPA Method TO-15
Missouri Dept. of Natural Resources
Workorder# 1812594

Nine 1 Liter Summa Canister samples were received on December 27, 2018. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

The Chain of Custody (COC) information for samples 184804-SG-02-05 South Side, 184805-SG-02-10 South Side, 184806-SG-03-05 East Side, 184807-SG-03-10 East Side, 184808-SG-04-05 North Side and 184809-SG-04-10 North Side did not match the entries on the sample tags with regard to sample identification. Therefore the information on the COC was used to process and report the samples.

The Chain of Custody contained incorrect method information. EATL proceeded with the analysis as per the original contract or verbal agreement.

Despite the use of flow controllers for sample collection, the final canister vacuum for samples 184802-SG-01-05 West Side and 184804-SG-02-05 South Side were measured at ambient pressure at the laboratory. A leak test indicated that the canister valves were functioning properly.

Analytical Notes

Dilution was performed on sample 184802-SG-01-05 West Side due to the presence of high level target species.

Dilution was performed on samples 184804-SG-02-05 South Side, 184805-SG-02-10 South Side, 184806-SG-03-05 East Side and 184808-SG-04-05 North Side due to the presence of high level non-target species.

As per client project requirements, for sample 184810 Ambient Air the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. Concentrations that are below the level at which the canister was certified (0.2 ppbv for compounds reported at 0.5 ppbv and 0.8 ppbv for compounds reported at 2.0 ppbv) may be false positives.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.
UJ- Non-detected compound associated with low bias in the CCV
N - The identification is based on presumptive evidence.
M - Reported value may be biased due to apparent matrix interferences.
CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 184802-SG-01-05 West Side

Lab ID#: 1812594-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,3-Butadiene	20	22	44	49
Hexane	20	590	71	2100
Cyclohexane	20	290	69	1000
2,2,4-Trimethylpentane	20	14000 E	94	68000 E
Benzene	20	57	64	180
Heptane	20	650	82	2600
Toluene	20	67	76	250
m,p-Xylene	20	27	87	120

Client Sample ID: 184803-SG-01-10 West Side

Lab ID#: 1812594-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,3-Butadiene	1.1	31	2.4	69
Ethanol	4.3	7.9	8.0	15
Acetone	11	48	25	110
Carbon Disulfide	4.3	5.6	13	17
Hexane	1.1	4.7	3.8	17
2-Butanone (Methyl Ethyl Ketone)	4.3	19	12	55
Chloroform	1.1	5.3	5.2	26
Cyclohexane	1.1	1.1	3.7	3.8
2,2,4-Trimethylpentane	1.1	14	5.0	67
Benzene	1.1	7.4	3.4	24
Heptane	1.1	2.5	4.4	10
Toluene	1.1	22	4.0	83
Tetrachloroethene	1.1	4.0	7.2	27
Ethyl Benzene	1.1	3.9	4.6	17
m,p-Xylene	1.1	11	4.6	46
o-Xylene	1.1	3.5	4.6	15
4-Ethyltoluene	1.1	2.4	5.2	12
1,2,4-Trimethylbenzene	1.1	2.5	5.2	12

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 184804-SG-02-05 South Side

Lab ID#: 1812594-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	8.1	16	15	30
Heptane	2.0	2.2	8.3	9.0
Toluene	2.0	29	7.6	110
Tetrachloroethene	2.0	3.8	14	25
Ethyl Benzene	2.0	5.1	8.8	22
m,p-Xylene	2.0	12	8.8	52
o-Xylene	2.0	4.2	8.8	18
4-Ethyltoluene	2.0	2.7	10	13
1,2,4-Trimethylbenzene	2.0	2.6	10	13

Client Sample ID: 184805-SG-02-10 South Side

Lab ID#: 1812594-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	14	20	27	37
Toluene	3.6	26	13	97
Ethyl Benzene	3.6	5.2	16	23
m,p-Xylene	3.6	11	16	47
o-Xylene	3.6	4.7	16	20

Client Sample ID: 184806-SG-03-05 East Side

Lab ID#: 1812594-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,3-Butadiene	2.2	13	4.8	29
Ethanol	8.7	16	16	30
Acetone	22	23	52	54
Hexane	2.2	6.9	7.6	24
Cyclohexane	2.2	3.3	7.5	11
2,2,4-Trimethylpentane	2.2	4.1	10	19
Benzene	2.2	4.7	6.9	15
Heptane	2.2	4.8	8.9	20
Toluene	2.2	23	8.2	86

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 184806-SG-03-05 East Side

Lab ID#: 1812594-05A

Ethyl Benzene	2.2	4.3	9.4	19
m,p-Xylene	2.2	10	9.4	46
o-Xylene	2.2	3.8	9.4	16
1,2,4-Trimethylbenzene	2.2	2.6	11	12

Client Sample ID: 184807-SG-03-10 East Side

Lab ID#: 1812594-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,3-Butadiene	1.0	14	2.3	30
Ethanol	4.1	9.8	7.8	18
Acetone	10	18	24	42
2-Propanol	4.1	4.2	10	10
Carbon Disulfide	4.1	4.7	13	15
Hexane	1.0	3.1	3.6	11
2-Butanone (Methyl Ethyl Ketone)	4.1	4.2	12	12
2,2,4-Trimethylpentane	1.0	2.1	4.8	9.9
Benzene	1.0	4.5	3.3	14
Heptane	1.0	3.1	4.2	13
Toluene	1.0	25	3.9	95
Tetrachloroethene	1.0	2.7	7.0	18
Ethyl Benzene	1.0	4.6	4.5	20
m,p-Xylene	1.0	11	4.5	48
o-Xylene	1.0	4.1	4.5	18
4-Ethyltoluene	1.0	2.7	5.1	13
1,2,4-Trimethylbenzene	1.0	2.7	5.1	13

Client Sample ID: 184808-SG-04-05 North Side

Lab ID#: 1812594-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	8.6	57	16	110
Acetone	22	25	51	59
2,2,4-Trimethylpentane	2.2	11	10	54

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 184808-SG-04-05 North Side

Lab ID#: 1812594-07A

Toluene	2.2	22	8.1	84
Tetrachloroethene	2.2	3.4	15	23
Ethyl Benzene	2.2	4.1	9.4	18
m,p-Xylene	2.2	10	9.4	46
o-Xylene	2.2	3.8	9.4	16
4-Ethyltoluene	2.2	2.3	10	11
1,2,4-Trimethylbenzene	2.2	2.4	10	12

Client Sample ID: 184809-SG-04-10 North Side

Lab ID#: 1812594-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,3-Butadiene	1.0	11	2.2	24
Ethanol	4.1	11	7.7	21
Acetone	10	20	24	49
2-Propanol	4.1	4.8	10	12
Hexane	1.0	1.7	3.6	6.0
Benzene	1.0	3.3	3.2	10
Heptane	1.0	1.6	4.2	6.8
Toluene	1.0	19	3.8	72
Tetrachloroethene	1.0	3.1	6.9	21
Ethyl Benzene	1.0	3.9	4.4	17
m,p-Xylene	1.0	11	4.4	48
o-Xylene	1.0	3.8	4.4	16
4-Ethyltoluene	1.0	2.0	5.0	10
1,3,5-Trimethylbenzene	1.0	1.1	5.0	5.6
1,2,4-Trimethylbenzene	1.0	2.4	5.0	12

Client Sample ID: 184810 Ambient Air

Lab ID#: 1812594-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.0	0.46 J	5.2	2.3 J
Freon 11	1.0	0.16 J	5.9	0.92 J

Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 184810 Ambient Air

Lab ID#: 1812594-09A

Acetone	10	8.9 J	25	21 J
2-Propanol	4.2	1.1 J	10	2.8 J
Hexane	1.0	0.25 J	3.7	0.87 J
Benzene	1.0	0.20 J	3.4	0.62 J
Toluene	1.0	2.2	4.0	8.4

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Client Sample ID: 184802-SG-01-05 West Side

Lab ID#: 1812594-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123125**	**Date of Collection:**	**12/19/18 10:55:00 A**
Dil. Factor:	**40.3**	**Date of Analysis:**	**1/1/19 12:20 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	20	Not Detected	100	Not Detected
Freon 114	20	Not Detected	140	Not Detected
Chloromethane	200	Not Detected	420	Not Detected
Vinyl Chloride	20	Not Detected	52	Not Detected
1,3-Butadiene	20	22	44	49
Bromomethane	200	Not Detected	780	Not Detected
Chloroethane	81	Not Detected	210	Not Detected
Freon 11	20	Not Detected	110	Not Detected
Ethanol	81	Not Detected	150	Not Detected
Freon 113	20	Not Detected	150	Not Detected
1,1-Dichloroethene	20	Not Detected	80	Not Detected
Acetone	200	Not Detected	480	Not Detected
2-Propanol	81	Not Detected	200	Not Detected
Carbon Disulfide	81	Not Detected	250	Not Detected
3-Chloropropene	81	Not Detected	250	Not Detected
Methylene Chloride	200	Not Detected	700	Not Detected
Methyl tert-butyl ether	81	Not Detected	290	Not Detected
trans-1,2-Dichloroethene	20	Not Detected	80	Not Detected
Hexane	20	590	71	2100
1,1-Dichloroethane	20	Not Detected	82	Not Detected
2-Butanone (Methyl Ethyl Ketone)	81	Not Detected	240	Not Detected
cis-1,2-Dichloroethene	20	Not Detected	80	Not Detected
Tetrahydrofuran	20	Not Detected	59	Not Detected
Chloroform	20	Not Detected	98	Not Detected
1,1,1-Trichloroethane	20	Not Detected	110	Not Detected
Cyclohexane	20	290	69	1000
Carbon Tetrachloride	20	Not Detected	130	Not Detected
2,2,4-Trimethylpentane	20	14000 E	94	68000 E
Benzene	20	57	64	180
1,2-Dichloroethane	20	Not Detected	82	Not Detected
Heptane	20	650	82	2600
Trichloroethene	20	Not Detected	110	Not Detected
1,2-Dichloropropane	20	Not Detected	93	Not Detected
1,4-Dioxane	81	Not Detected	290	Not Detected
Bromodichloromethane	20	Not Detected	140	Not Detected
cis-1,3-Dichloropropene	20	Not Detected	91	Not Detected
4-Methyl-2-pentanone	20	Not Detected	82	Not Detected
Toluene	20	67	76	250
trans-1,3-Dichloropropene	20	Not Detected	91	Not Detected
1,1,2-Trichloroethane	20	Not Detected	110	Not Detected
Tetrachloroethene	20	Not Detected	140	Not Detected
2-Hexanone	81	Not Detected	330	Not Detected

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Client Sample ID: 184802-SG-01-05 West Side

Lab ID#: 1812594-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123125**	**Date of Collection:**	**12/19/18 10:55:00 A**
Dil. Factor:	**40.3**	**Date of Analysis:**	**1/1/19 12:20 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	20	Not Detected	170	Not Detected
1,2-Dibromoethane (EDB)	20	Not Detected	150	Not Detected
Chlorobenzene	20	Not Detected	93	Not Detected
Ethyl Benzene	20	Not Detected	87	Not Detected
m,p-Xylene	20	27	87	120
o-Xylene	20	Not Detected	87	Not Detected
Styrene	20	Not Detected	86	Not Detected
Bromoform	20	Not Detected	210	Not Detected
Cumene	20	Not Detected	99	Not Detected
1,1,2,2-Tetrachloroethane	20	Not Detected	140	Not Detected
Propylbenzene	20	Not Detected	99	Not Detected
4-Ethyltoluene	20	Not Detected	99	Not Detected
1,3,5-Trimethylbenzene	20	Not Detected	99	Not Detected
1,2,4-Trimethylbenzene	20	Not Detected	99	Not Detected
1,3-Dichlorobenzene	20	Not Detected	120	Not Detected
1,4-Dichlorobenzene	20	Not Detected	120	Not Detected
alpha-Chlorotoluene	20	Not Detected	100	Not Detected
1,2-Dichlorobenzene	20	Not Detected	120	Not Detected
1,2,4-Trichlorobenzene	81	Not Detected	600	Not Detected
Hexachlorobutadiene	81	Not Detected	860	Not Detected

E = Exceeds instrument calibration range.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	127	70-130
4-Bromofluorobenzene	107	70-130

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Client Sample ID: 184803-SG-01-10 West Side

Lab ID#: 1812594-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123111**	**Date of Collection:**	**12/19/18 12:02:00 P**
Dil. Factor:	**2.13**	**Date of Analysis:**	**12/31/18 05:10 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.1	Not Detected	5.3	Not Detected
Freon 114	1.1	Not Detected	7.4	Not Detected
Chloromethane	11	Not Detected	22	Not Detected
Vinyl Chloride	1.1	Not Detected	2.7	Not Detected
1,3-Butadiene	1.1	31	2.4	69
Bromomethane	11	Not Detected	41	Not Detected
Chloroethane	4.3	Not Detected	11	Not Detected
Freon 11	1.1	Not Detected	6.0	Not Detected
Ethanol	4.3	7.9	8.0	15
Freon 113	1.1	Not Detected	8.2	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.2	Not Detected
Acetone	11	48	25	110
2-Propanol	4.3	Not Detected	10	Not Detected
Carbon Disulfide	4.3	5.6	13	17
3-Chloropropene	4.3	Not Detected	13	Not Detected
Methylene Chloride	11	Not Detected	37	Not Detected
Methyl tert-butyl ether	4.3	Not Detected	15	Not Detected
trans-1,2-Dichloroethene	1.1	Not Detected	4.2	Not Detected
Hexane	1.1	4.7	3.8	17
1,1-Dichloroethane	1.1	Not Detected	4.3	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.3	19	12	55
cis-1,2-Dichloroethene	1.1	Not Detected	4.2	Not Detected
Tetrahydrofuran	1.1	Not Detected	3.1	Not Detected
Chloroform	1.1	5.3	5.2	26
1,1,1-Trichloroethane	1.1	Not Detected	5.8	Not Detected
Cyclohexane	1.1	1.1	3.7	3.8
Carbon Tetrachloride	1.1	Not Detected	6.7	Not Detected
2,2,4-Trimethylpentane	1.1	14	5.0	67
Benzene	1.1	7.4	3.4	24
1,2-Dichloroethane	1.1	Not Detected	4.3	Not Detected
Heptane	1.1	2.5	4.4	10
Trichloroethene	1.1	Not Detected	5.7	Not Detected
1,2-Dichloropropane	1.1	Not Detected	4.9	Not Detected
1,4-Dioxane	4.3	Not Detected	15	Not Detected
Bromodichloromethane	1.1	Not Detected	7.1	Not Detected
cis-1,3-Dichloropropene	1.1	Not Detected	4.8	Not Detected
4-Methyl-2-pentanone	1.1	Not Detected	4.4	Not Detected
Toluene	1.1	22	4.0	83
trans-1,3-Dichloropropene	1.1	Not Detected	4.8	Not Detected
1,1,2-Trichloroethane	1.1	Not Detected	5.8	Not Detected
Tetrachloroethene	1.1	4.0	7.2	27
2-Hexanone	4.3	Not Detected	17	Not Detected

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Client Sample ID: 184803-SG-01-10 West Side

Lab ID#: 1812594-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123111**	**Date of Collection:**	**12/19/18 12:02:00 P**
Dil. Factor:	**2.13**	**Date of Analysis:**	**12/31/18 05:10 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.1	Not Detected	9.1	Not Detected
1,2-Dibromoethane (EDB)	1.1	Not Detected	8.2	Not Detected
Chlorobenzene	1.1	Not Detected	4.9	Not Detected
Ethyl Benzene	1.1	3.9	4.6	17
m,p-Xylene	1.1	11	4.6	46
o-Xylene	1.1	3.5	4.6	15
Styrene	1.1	Not Detected	4.5	Not Detected
Bromoform	1.1	Not Detected	11	Not Detected
Cumene	1.1	Not Detected	5.2	Not Detected
1,1,2,2-Tetrachloroethane	1.1	Not Detected	7.3	Not Detected
Propylbenzene	1.1	Not Detected	5.2	Not Detected
4-Ethyltoluene	1.1	2.4	5.2	12
1,3,5-Trimethylbenzene	1.1	Not Detected	5.2	Not Detected
1,2,4-Trimethylbenzene	1.1	2.5	5.2	12
1,3-Dichlorobenzene	1.1	Not Detected	6.4	Not Detected
1,4-Dichlorobenzene	1.1	Not Detected	6.4	Not Detected
alpha-Chlorotoluene	1.1	Not Detected	5.5	Not Detected
1,2-Dichlorobenzene	1.1	Not Detected	6.4	Not Detected
1,2,4-Trichlorobenzene	4.3	Not Detected	32	Not Detected
Hexachlorobutadiene	4.3	Not Detected	45	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	112	70-130

eurofins | Air Toxics

Client Sample ID: 184804-SG-02-05 South Side

Lab ID#: 1812594-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123123**	**Date of Collection:**	**12/19/18 12:35:00 P**
Dil. Factor:	**4.05**	**Date of Analysis:**	**12/31/18 11:30 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	2.0	Not Detected	10	Not Detected
Freon 114	2.0	Not Detected	14	Not Detected
Chloromethane	20	Not Detected	42	Not Detected
Vinyl Chloride	2.0	Not Detected	5.2	Not Detected
1,3-Butadiene	2.0	Not Detected	4.5	Not Detected
Bromomethane	20	Not Detected	79	Not Detected
Chloroethane	8.1	Not Detected	21	Not Detected
Freon 11	2.0	Not Detected	11	Not Detected
Ethanol	8.1	16	15	30
Freon 113	2.0	Not Detected	16	Not Detected
1,1-Dichloroethene	2.0	Not Detected	8.0	Not Detected
Acetone	20	Not Detected	48	Not Detected
2-Propanol	8.1	Not Detected	20	Not Detected
Carbon Disulfide	8.1	Not Detected	25	Not Detected
3-Chloropropene	8.1	Not Detected	25	Not Detected
Methylene Chloride	20	Not Detected	70	Not Detected
Methyl tert-butyl ether	8.1	Not Detected	29	Not Detected
trans-1,2-Dichloroethene	2.0	Not Detected	8.0	Not Detected
Hexane	2.0	Not Detected	7.1	Not Detected
1,1-Dichloroethane	2.0	Not Detected	8.2	Not Detected
2-Butanone (Methyl Ethyl Ketone)	8.1	Not Detected	24	Not Detected
cis-1,2-Dichloroethene	2.0	Not Detected	8.0	Not Detected
Tetrahydrofuran	2.0	Not Detected	6.0	Not Detected
Chloroform	2.0	Not Detected	9.9	Not Detected
1,1,1-Trichloroethane	2.0	Not Detected	11	Not Detected
Cyclohexane	2.0	Not Detected	7.0	Not Detected
Carbon Tetrachloride	2.0	Not Detected	13	Not Detected
2,2,4-Trimethylpentane	2.0	Not Detected	9.4	Not Detected
Benzene	2.0	Not Detected	6.5	Not Detected
1,2-Dichloroethane	2.0	Not Detected	8.2	Not Detected
Heptane	2.0	2.2	8.3	9.0
Trichloroethene	2.0	Not Detected	11	Not Detected
1,2-Dichloropropane	2.0	Not Detected	9.4	Not Detected
1,4-Dioxane	8.1	Not Detected	29	Not Detected
Bromodichloromethane	2.0	Not Detected	14	Not Detected
cis-1,3-Dichloropropene	2.0	Not Detected	9.2	Not Detected
4-Methyl-2-pentanone	2.0	Not Detected	8.3	Not Detected
Toluene	2.0	29	7.6	110
trans-1,3-Dichloropropene	2.0	Not Detected	9.2	Not Detected
1,1,2-Trichloroethane	2.0	Not Detected	11	Not Detected
Tetrachloroethene	2.0	3.8	14	25
2-Hexanone	8.1	Not Detected	33	Not Detected

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Client Sample ID: 184804-SG-02-05 South Side

Lab ID#: 1812594-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123123**	**Date of Collection:**	**12/19/18 12:35:00 P**
Dil. Factor:	**4.05**	**Date of Analysis:**	**12/31/18 11:30 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	2.0	Not Detected	17	Not Detected
1,2-Dibromoethane (EDB)	2.0	Not Detected	16	Not Detected
Chlorobenzene	2.0	Not Detected	9.3	Not Detected
Ethyl Benzene	2.0	5.1	8.8	22
m,p-Xylene	2.0	12	8.8	52
o-Xylene	2.0	4.2	8.8	18
Styrene	2.0	Not Detected	8.6	Not Detected
Bromoform	2.0	Not Detected	21	Not Detected
Cumene	2.0	Not Detected	10	Not Detected
1,1,2,2-Tetrachloroethane	2.0	Not Detected	14	Not Detected
Propylbenzene	2.0	Not Detected	10	Not Detected
4-Ethyltoluene	2.0	2.7	10	13
1,3,5-Trimethylbenzene	2.0	Not Detected	10	Not Detected
1,2,4-Trimethylbenzene	2.0	2.6	10	13
1,3-Dichlorobenzene	2.0	Not Detected	12	Not Detected
1,4-Dichlorobenzene	2.0	Not Detected	12	Not Detected
alpha-Chlorotoluene	2.0	Not Detected	10	Not Detected
1,2-Dichlorobenzene	2.0	Not Detected	12	Not Detected
1,2,4-Trichlorobenzene	8.1	Not Detected	60	Not Detected
Hexachlorobutadiene	8.1	Not Detected	86	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	116	70-130

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Client Sample ID: 184805-SG-02-10 South Side

Lab ID#: 1812594-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123124**	**Date of Collection:**	**12/19/18 12:20:00 P**
Dil. Factor:	**7.16**	**Date of Analysis:**	**12/31/18 11:55 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	3.6	Not Detected	18	Not Detected
Freon 114	3.6	Not Detected	25	Not Detected
Chloromethane	36	Not Detected	74	Not Detected
Vinyl Chloride	3.6	Not Detected	9.2	Not Detected
1,3-Butadiene	3.6	Not Detected	7.9	Not Detected
Bromomethane	36	Not Detected	140	Not Detected
Chloroethane	14	Not Detected	38	Not Detected
Freon 11	3.6	Not Detected	20	Not Detected
Ethanol	14	20	27	37
Freon 113	3.6	Not Detected	27	Not Detected
1,1-Dichloroethene	3.6	Not Detected	14	Not Detected
Acetone	36	Not Detected	85	Not Detected
2-Propanol	14	Not Detected	35	Not Detected
Carbon Disulfide	14	Not Detected	44	Not Detected
3-Chloropropene	14	Not Detected	45	Not Detected
Methylene Chloride	36	Not Detected	120	Not Detected
Methyl tert-butyl ether	14	Not Detected	52	Not Detected
trans-1,2-Dichloroethene	3.6	Not Detected	14	Not Detected
Hexane	3.6	Not Detected	13	Not Detected
1,1-Dichloroethane	3.6	Not Detected	14	Not Detected
2-Butanone (Methyl Ethyl Ketone)	14	Not Detected	42	Not Detected
cis-1,2-Dichloroethene	3.6	Not Detected	14	Not Detected
Tetrahydrofuran	3.6	Not Detected	10	Not Detected
Chloroform	3.6	Not Detected	17	Not Detected
1,1,1-Trichloroethane	3.6	Not Detected	20	Not Detected
Cyclohexane	3.6	Not Detected	12	Not Detected
Carbon Tetrachloride	3.6	Not Detected	22	Not Detected
2,2,4-Trimethylpentane	3.6	Not Detected	17	Not Detected
Benzene	3.6	Not Detected	11	Not Detected
1,2-Dichloroethane	3.6	Not Detected	14	Not Detected
Heptane	3.6	Not Detected	15	Not Detected
Trichloroethene	3.6	Not Detected	19	Not Detected
1,2-Dichloropropane	3.6	Not Detected	16	Not Detected
1,4-Dioxane	14	Not Detected	52	Not Detected
Bromodichloromethane	3.6	Not Detected	24	Not Detected
cis-1,3-Dichloropropene	3.6	Not Detected	16	Not Detected
4-Methyl-2-pentanone	3.6	Not Detected	15	Not Detected
Toluene	3.6	26	13	97
trans-1,3-Dichloropropene	3.6	Not Detected	16	Not Detected
1,1,2-Trichloroethane	3.6	Not Detected	20	Not Detected
Tetrachloroethene	3.6	Not Detected	24	Not Detected
2-Hexanone	14	Not Detected	59	Not Detected

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Client Sample ID: 184805-SG-02-10 South Side

Lab ID#: 1812594-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123124**	**Date of Collection:**	**12/19/18 12:20:00 P**
Dil. Factor:	**7.16**	**Date of Analysis:**	**12/31/18 11:55 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	3.6	Not Detected	30	Not Detected
1,2-Dibromoethane (EDB)	3.6	Not Detected	28	Not Detected
Chlorobenzene	3.6	Not Detected	16	Not Detected
Ethyl Benzene	3.6	5.2	16	23
m,p-Xylene	3.6	11	16	47
o-Xylene	3.6	4.7	16	20
Styrene	3.6	Not Detected	15	Not Detected
Bromoform	3.6	Not Detected	37	Not Detected
Cumene	3.6	Not Detected	18	Not Detected
1,1,2,2-Tetrachloroethane	3.6	Not Detected	24	Not Detected
Propylbenzene	3.6	Not Detected	18	Not Detected
4-Ethyltoluene	3.6	Not Detected	18	Not Detected
1,3,5-Trimethylbenzene	3.6	Not Detected	18	Not Detected
1,2,4-Trimethylbenzene	3.6	Not Detected	18	Not Detected
1,3-Dichlorobenzene	3.6	Not Detected	22	Not Detected
1,4-Dichlorobenzene	3.6	Not Detected	22	Not Detected
alpha-Chlorotoluene	3.6	Not Detected	18	Not Detected
1,2-Dichlorobenzene	3.6	Not Detected	22	Not Detected
1,2,4-Trichlorobenzene	14	Not Detected	110	Not Detected
Hexachlorobutadiene	14	Not Detected	150	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	93	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	114	70-130

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Client Sample ID: 184806-SG-03-05 East Side

Lab ID#: 1812594-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123122**	**Date of Collection:**	**12/19/18 1:09:00 PM**
Dil. Factor:	**4.34**	**Date of Analysis:**	**12/31/18 11:06 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	2.2	Not Detected	11	Not Detected
Freon 114	2.2	Not Detected	15	Not Detected
Chloromethane	22	Not Detected	45	Not Detected
Vinyl Chloride	2.2	Not Detected	5.5	Not Detected
1,3-Butadiene	2.2	13	4.8	29
Bromomethane	22	Not Detected	84	Not Detected
Chloroethane	8.7	Not Detected	23	Not Detected
Freon 11	2.2	Not Detected	12	Not Detected
Ethanol	8.7	16	16	30
Freon 113	2.2	Not Detected	17	Not Detected
1,1-Dichloroethene	2.2	Not Detected	8.6	Not Detected
Acetone	22	23	52	54
2-Propanol	8.7	Not Detected	21	Not Detected
Carbon Disulfide	8.7	Not Detected	27	Not Detected
3-Chloropropene	8.7	Not Detected	27	Not Detected
Methylene Chloride	22	Not Detected	75	Not Detected
Methyl tert-butyl ether	8.7	Not Detected	31	Not Detected
trans-1,2-Dichloroethene	2.2	Not Detected	8.6	Not Detected
Hexane	2.2	6.9	7.6	24
1,1-Dichloroethane	2.2	Not Detected	8.8	Not Detected
2-Butanone (Methyl Ethyl Ketone)	8.7	Not Detected	26	Not Detected
cis-1,2-Dichloroethene	2.2	Not Detected	8.6	Not Detected
Tetrahydrofuran	2.2	Not Detected	6.4	Not Detected
Chloroform	2.2	Not Detected	10	Not Detected
1,1,1-Trichloroethane	2.2	Not Detected	12	Not Detected
Cyclohexane	2.2	3.3	7.5	11
Carbon Tetrachloride	2.2	Not Detected	14	Not Detected
2,2,4-Trimethylpentane	2.2	4.1	10	19
Benzene	2.2	4.7	6.9	15
1,2-Dichloroethane	2.2	Not Detected	8.8	Not Detected
Heptane	2.2	4.8	8.9	20
Trichloroethene	2.2	Not Detected	12	Not Detected
1,2-Dichloropropane	2.2	Not Detected	10	Not Detected
1,4-Dioxane	8.7	Not Detected	31	Not Detected
Bromodichloromethane	2.2	Not Detected	14	Not Detected
cis-1,3-Dichloropropene	2.2	Not Detected	9.8	Not Detected
4-Methyl-2-pentanone	2.2	Not Detected	8.9	Not Detected
Toluene	2.2	23	8.2	86
trans-1,3-Dichloropropene	2.2	Not Detected	9.8	Not Detected
1,1,2-Trichloroethane	2.2	Not Detected	12	Not Detected
Tetrachloroethene	2.2	Not Detected	15	Not Detected
2-Hexanone	8.7	Not Detected	36	Not Detected

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Client Sample ID: 184806-SG-03-05 East Side

Lab ID#: 1812594-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123122**	**Date of Collection:**	**12/19/18 1:09:00 PM**
Dil. Factor:	**4.34**	**Date of Analysis:**	**12/31/18 11:06 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	2.2	Not Detected	18	Not Detected
1,2-Dibromoethane (EDB)	2.2	Not Detected	17	Not Detected
Chlorobenzene	2.2	Not Detected	10	Not Detected
Ethyl Benzene	2.2	4.3	9.4	19
m,p-Xylene	2.2	10	9.4	46
o-Xylene	2.2	3.8	9.4	16
Styrene	2.2	Not Detected	9.2	Not Detected
Bromoform	2.2	Not Detected	22	Not Detected
Cumene	2.2	Not Detected	11	Not Detected
1,1,2,2-Tetrachloroethane	2.2	Not Detected	15	Not Detected
Propylbenzene	2.2	Not Detected	11	Not Detected
4-Ethyltoluene	2.2	Not Detected	11	Not Detected
1,3,5-Trimethylbenzene	2.2	Not Detected	11	Not Detected
1,2,4-Trimethylbenzene	2.2	2.6	11	12
1,3-Dichlorobenzene	2.2	Not Detected	13	Not Detected
1,4-Dichlorobenzene	2.2	Not Detected	13	Not Detected
alpha-Chlorotoluene	2.2	Not Detected	11	Not Detected
1,2-Dichlorobenzene	2.2	Not Detected	13	Not Detected
1,2,4-Trichlorobenzene	8.7	Not Detected	64	Not Detected
Hexachlorobutadiene	8.7	Not Detected	92	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	99	70-130
4-Bromofluorobenzene	115	70-130

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Client Sample ID: 184807-SG-03-10 East Side

Lab ID#: 1812594-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123112**	**Date of Collection:**	**12/19/18 1:12:00 PM**
Dil. Factor:	**2.07**	**Date of Analysis:**	**12/31/18 05:36 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.0	Not Detected	5.1	Not Detected
Freon 114	1.0	Not Detected	7.2	Not Detected
Chloromethane	10	Not Detected	21	Not Detected
Vinyl Chloride	1.0	Not Detected	2.6	Not Detected
1,3-Butadiene	1.0	14	2.3	30
Bromomethane	10	Not Detected	40	Not Detected
Chloroethane	4.1	Not Detected	11	Not Detected
Freon 11	1.0	Not Detected	5.8	Not Detected
Ethanol	4.1	9.8	7.8	18
Freon 113	1.0	Not Detected	7.9	Not Detected
1,1-Dichloroethene	1.0	Not Detected	4.1	Not Detected
Acetone	10	18	24	42
2-Propanol	4.1	4.2	10	10
Carbon Disulfide	4.1	4.7	13	15
3-Chloropropene	4.1	Not Detected	13	Not Detected
Methylene Chloride	10	Not Detected	36	Not Detected
Methyl tert-butyl ether	4.1	Not Detected	15	Not Detected
trans-1,2-Dichloroethene	1.0	Not Detected	4.1	Not Detected
Hexane	1.0	3.1	3.6	11
1,1-Dichloroethane	1.0	Not Detected	4.2	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.1	4.2	12	12
cis-1,2-Dichloroethene	1.0	Not Detected	4.1	Not Detected
Tetrahydrofuran	1.0	Not Detected	3.0	Not Detected
Chloroform	1.0	Not Detected	5.0	Not Detected
1,1,1-Trichloroethane	1.0	Not Detected	5.6	Not Detected
Cyclohexane	1.0	Not Detected	3.6	Not Detected
Carbon Tetrachloride	1.0	Not Detected	6.5	Not Detected
2,2,4-Trimethylpentane	1.0	2.1	4.8	9.9
Benzene	1.0	4.5	3.3	14
1,2-Dichloroethane	1.0	Not Detected	4.2	Not Detected
Heptane	1.0	3.1	4.2	13
Trichloroethene	1.0	Not Detected	5.6	Not Detected
1,2-Dichloropropane	1.0	Not Detected	4.8	Not Detected
1,4-Dioxane	4.1	Not Detected	15	Not Detected
Bromodichloromethane	1.0	Not Detected	6.9	Not Detected
cis-1,3-Dichloropropene	1.0	Not Detected	4.7	Not Detected
4-Methyl-2-pentanone	1.0	Not Detected	4.2	Not Detected
Toluene	1.0	25	3.9	95
trans-1,3-Dichloropropene	1.0	Not Detected	4.7	Not Detected
1,1,2-Trichloroethane	1.0	Not Detected	5.6	Not Detected
Tetrachloroethene	1.0	2.7	7.0	18
2-Hexanone	4.1	Not Detected	17	Not Detected

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Client Sample ID: 184807-SG-03-10 East Side

Lab ID#: 1812594-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123112**	**Date of Collection:**	**12/19/18 1:12:00 PM**
Dil. Factor:	**2.07**	**Date of Analysis:**	**12/31/18 05:36 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.0	Not Detected	8.8	Not Detected
1,2-Dibromoethane (EDB)	1.0	Not Detected	8.0	Not Detected
Chlorobenzene	1.0	Not Detected	4.8	Not Detected
Ethyl Benzene	1.0	4.6	4.5	20
m,p-Xylene	1.0	11	4.5	48
o-Xylene	1.0	4.1	4.5	18
Styrene	1.0	Not Detected	4.4	Not Detected
Bromoform	1.0	Not Detected	11	Not Detected
Cumene	1.0	Not Detected	5.1	Not Detected
1,1,2,2-Tetrachloroethane	1.0	Not Detected	7.1	Not Detected
Propylbenzene	1.0	Not Detected	5.1	Not Detected
4-Ethyltoluene	1.0	2.7	5.1	13
1,3,5-Trimethylbenzene	1.0	Not Detected	5.1	Not Detected
1,2,4-Trimethylbenzene	1.0	2.7	5.1	13
1,3-Dichlorobenzene	1.0	Not Detected	6.2	Not Detected
1,4-Dichlorobenzene	1.0	Not Detected	6.2	Not Detected
alpha-Chlorotoluene	1.0	Not Detected	5.4	Not Detected
1,2-Dichlorobenzene	1.0	Not Detected	6.2	Not Detected
1,2,4-Trichlorobenzene	4.1	Not Detected	31	Not Detected
Hexachlorobutadiene	4.1	Not Detected	44	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	98	70-130
4-Bromofluorobenzene	112	70-130

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Client Sample ID: 184808-SG-04-05 North Side

Lab ID#: 1812594-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123121**	**Date of Collection:**	**12/19/18 1:49:00 PM**
Dil. Factor:	**4.31**	**Date of Analysis:**	**12/31/18 10:41 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	2.2	Not Detected	11	Not Detected
Freon 114	2.2	Not Detected	15	Not Detected
Chloromethane	22	Not Detected	44	Not Detected
Vinyl Chloride	2.2	Not Detected	5.5	Not Detected
1,3-Butadiene	2.2	Not Detected	4.8	Not Detected
Bromomethane	22	Not Detected	84	Not Detected
Chloroethane	8.6	Not Detected	23	Not Detected
Freon 11	2.2	Not Detected	12	Not Detected
Ethanol	8.6	57	16	110
Freon 113	2.2	Not Detected	16	Not Detected
1,1-Dichloroethene	2.2	Not Detected	8.5	Not Detected
Acetone	22	25	51	59
2-Propanol	8.6	Not Detected	21	Not Detected
Carbon Disulfide	8.6	Not Detected	27	Not Detected
3-Chloropropene	8.6	Not Detected	27	Not Detected
Methylene Chloride	22	Not Detected	75	Not Detected
Methyl tert-butyl ether	8.6	Not Detected	31	Not Detected
trans-1,2-Dichloroethene	2.2	Not Detected	8.5	Not Detected
Hexane	2.2	Not Detected	7.6	Not Detected
1,1-Dichloroethane	2.2	Not Detected	8.7	Not Detected
2-Butanone (Methyl Ethyl Ketone)	8.6	Not Detected	25	Not Detected
cis-1,2-Dichloroethene	2.2	Not Detected	8.5	Not Detected
Tetrahydrofuran	2.2	Not Detected	6.4	Not Detected
Chloroform	2.2	Not Detected	10	Not Detected
1,1,1-Trichloroethane	2.2	Not Detected	12	Not Detected
Cyclohexane	2.2	Not Detected	7.4	Not Detected
Carbon Tetrachloride	2.2	Not Detected	14	Not Detected
2,2,4-Trimethylpentane	2.2	11	10	54
Benzene	2.2	Not Detected	6.9	Not Detected
1,2-Dichloroethane	2.2	Not Detected	8.7	Not Detected
Heptane	2.2	Not Detected	8.8	Not Detected
Trichloroethene	2.2	Not Detected	12	Not Detected
1,2-Dichloropropane	2.2	Not Detected	10	Not Detected
1,4-Dioxane	8.6	Not Detected	31	Not Detected
Bromodichloromethane	2.2	Not Detected	14	Not Detected
cis-1,3-Dichloropropene	2.2	Not Detected	9.8	Not Detected
4-Methyl-2-pentanone	2.2	Not Detected	8.8	Not Detected
Toluene	2.2	22	8.1	84
trans-1,3-Dichloropropene	2.2	Not Detected	9.8	Not Detected
1,1,2-Trichloroethane	2.2	Not Detected	12	Not Detected
Tetrachloroethene	2.2	3.4	15	23
2-Hexanone	8.6	Not Detected	35	Not Detected

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Client Sample ID: 184808-SG-04-05 North Side

Lab ID#: 1812594-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123121**	**Date of Collection:**	**12/19/18 1:49:00 PM**
Dil. Factor:	**4.31**	**Date of Analysis:**	**12/31/18 10:41 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	2.2	Not Detected	18	Not Detected
1,2-Dibromoethane (EDB)	2.2	Not Detected	16	Not Detected
Chlorobenzene	2.2	Not Detected	9.9	Not Detected
Ethyl Benzene	2.2	4.1	9.4	18
m,p-Xylene	2.2	10	9.4	46
o-Xylene	2.2	3.8	9.4	16
Styrene	2.2	Not Detected	9.2	Not Detected
Bromoform	2.2	Not Detected	22	Not Detected
Cumene	2.2	Not Detected	10	Not Detected
1,1,2,2-Tetrachloroethane	2.2	Not Detected	15	Not Detected
Propylbenzene	2.2	Not Detected	10	Not Detected
4-Ethyltoluene	2.2	2.3	10	11
1,3,5-Trimethylbenzene	2.2	Not Detected	10	Not Detected
1,2,4-Trimethylbenzene	2.2	2.4	10	12
1,3-Dichlorobenzene	2.2	Not Detected	13	Not Detected
1,4-Dichlorobenzene	2.2	Not Detected	13	Not Detected
alpha-Chlorotoluene	2.2	Not Detected	11	Not Detected
1,2-Dichlorobenzene	2.2	Not Detected	13	Not Detected
1,2,4-Trichlorobenzene	8.6	Not Detected	64	Not Detected
Hexachlorobutadiene	8.6	Not Detected	92	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	91	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	114	70-130

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Client Sample ID: 184809-SG-04-10 North Side

Lab ID#: 1812594-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123120**	**Date of Collection:**	**12/19/18 1:48:00 PM**
Dil. Factor:	**2.04**	**Date of Analysis:**	**12/31/18 10:16 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.0	Not Detected	5.0	Not Detected
Freon 114	1.0	Not Detected	7.1	Not Detected
Chloromethane	10	Not Detected	21	Not Detected
Vinyl Chloride	1.0	Not Detected	2.6	Not Detected
1,3-Butadiene	1.0	11	2.2	24
Bromomethane	10	Not Detected	40	Not Detected
Chloroethane	4.1	Not Detected	11	Not Detected
Freon 11	1.0	Not Detected	5.7	Not Detected
Ethanol	4.1	11	7.7	21
Freon 113	1.0	Not Detected	7.8	Not Detected
1,1-Dichloroethene	1.0	Not Detected	4.0	Not Detected
Acetone	10	20	24	49
2-Propanol	4.1	4.8	10	12
Carbon Disulfide	4.1	Not Detected	13	Not Detected
3-Chloropropene	4.1	Not Detected	13	Not Detected
Methylene Chloride	10	Not Detected	35	Not Detected
Methyl tert-butyl ether	4.1	Not Detected	15	Not Detected
trans-1,2-Dichloroethene	1.0	Not Detected	4.0	Not Detected
Hexane	1.0	1.7	3.6	6.0
1,1-Dichloroethane	1.0	Not Detected	4.1	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.1	Not Detected	12	Not Detected
cis-1,2-Dichloroethene	1.0	Not Detected	4.0	Not Detected
Tetrahydrofuran	1.0	Not Detected	3.0	Not Detected
Chloroform	1.0	Not Detected	5.0	Not Detected
1,1,1-Trichloroethane	1.0	Not Detected	5.6	Not Detected
Cyclohexane	1.0	Not Detected	3.5	Not Detected
Carbon Tetrachloride	1.0	Not Detected	6.4	Not Detected
2,2,4-Trimethylpentane	1.0	Not Detected	4.8	Not Detected
Benzene	1.0	3.3	3.2	10
1,2-Dichloroethane	1.0	Not Detected	4.1	Not Detected
Heptane	1.0	1.6	4.2	6.8
Trichloroethene	1.0	Not Detected	5.5	Not Detected
1,2-Dichloropropane	1.0	Not Detected	4.7	Not Detected
1,4-Dioxane	4.1	Not Detected	15	Not Detected
Bromodichloromethane	1.0	Not Detected	6.8	Not Detected
cis-1,3-Dichloropropene	1.0	Not Detected	4.6	Not Detected
4-Methyl-2-pentanone	1.0	Not Detected	4.2	Not Detected
Toluene	1.0	19	3.8	72
trans-1,3-Dichloropropene	1.0	Not Detected	4.6	Not Detected
1,1,2-Trichloroethane	1.0	Not Detected	5.6	Not Detected
Tetrachloroethene	1.0	3.1	6.9	21
2-Hexanone	4.1	Not Detected	17	Not Detected

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Client Sample ID: 184809-SG-04-10 North Side

Lab ID#: 1812594-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123120**	**Date of Collection:**	**12/19/18 1:48:00 PM**
Dil. Factor:	**2.04**	**Date of Analysis:**	**12/31/18 10:16 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.0	Not Detected	8.7	Not Detected
1,2-Dibromoethane (EDB)	1.0	Not Detected	7.8	Not Detected
Chlorobenzene	1.0	Not Detected	4.7	Not Detected
Ethyl Benzene	1.0	3.9	4.4	17
m,p-Xylene	1.0	11	4.4	48
o-Xylene	1.0	3.8	4.4	16
Styrene	1.0	Not Detected	4.3	Not Detected
Bromoform	1.0	Not Detected	10	Not Detected
Cumene	1.0	Not Detected	5.0	Not Detected
1,1,2,2-Tetrachloroethane	1.0	Not Detected	7.0	Not Detected
Propylbenzene	1.0	Not Detected	5.0	Not Detected
4-Ethyltoluene	1.0	2.0	5.0	10
1,3,5-Trimethylbenzene	1.0	1.1	5.0	5.6
1,2,4-Trimethylbenzene	1.0	2.4	5.0	12
1,3-Dichlorobenzene	1.0	Not Detected	6.1	Not Detected
1,4-Dichlorobenzene	1.0	Not Detected	6.1	Not Detected
alpha-Chlorotoluene	1.0	Not Detected	5.3	Not Detected
1,2-Dichlorobenzene	1.0	Not Detected	6.1	Not Detected
1,2,4-Trichlorobenzene	4.1	Not Detected	30	Not Detected
Hexachlorobutadiene	4.1	Not Detected	44	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	93	70-130
1,2-Dichloroethane-d4	101	70-130
4-Bromofluorobenzene	116	70-130

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Client Sample ID: 184810 Ambient Air

Lab ID#: 1812594-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123119**	**Date of Collection:**	**12/19/18 2:17:00 PM**
Dil. Factor:	**2.10**	**Date of Analysis:**	**12/31/18 09:50 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.0	0.46 J	5.2	2.3 J
Freon 114	1.0	Not Detected	7.3	Not Detected
Chloromethane	10	Not Detected	22	Not Detected
Vinyl Chloride	1.0	Not Detected	2.7	Not Detected
1,3-Butadiene	1.0	Not Detected	2.3	Not Detected
Bromomethane	10	Not Detected	41	Not Detected
Chloroethane	4.2	Not Detected	11	Not Detected
Freon 11	1.0	0.16 J	5.9	0.92 J
Ethanol	4.2	Not Detected	7.9	Not Detected
Freon 113	1.0	Not Detected	8.0	Not Detected
1,1-Dichloroethene	1.0	Not Detected	4.2	Not Detected
Acetone	10	8.9 J	25	21 J
2-Propanol	4.2	1.1 J	10	2.8 J
Carbon Disulfide	4.2	Not Detected	13	Not Detected
3-Chloropropene	4.2	Not Detected	13	Not Detected
Methylene Chloride	10	Not Detected	36	Not Detected
Methyl tert-butyl ether	4.2	Not Detected	15	Not Detected
trans-1,2-Dichloroethene	1.0	Not Detected	4.2	Not Detected
Hexane	1.0	0.25 J	3.7	0.87 J
1,1-Dichloroethane	1.0	Not Detected	4.2	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.2	Not Detected	12	Not Detected
cis-1,2-Dichloroethene	1.0	Not Detected	4.2	Not Detected
Tetrahydrofuran	1.0	Not Detected	3.1	Not Detected
Chloroform	1.0	Not Detected	5.1	Not Detected
1,1,1-Trichloroethane	1.0	Not Detected	5.7	Not Detected
Cyclohexane	1.0	Not Detected	3.6	Not Detected
Carbon Tetrachloride	1.0	Not Detected	6.6	Not Detected
2,2,4-Trimethylpentane	1.0	Not Detected	4.9	Not Detected
Benzene	1.0	0.20 J	3.4	0.62 J
1,2-Dichloroethane	1.0	Not Detected	4.2	Not Detected
Heptane	1.0	Not Detected	4.3	Not Detected
Trichloroethene	1.0	Not Detected	5.6	Not Detected
1,2-Dichloropropane	1.0	Not Detected	4.8	Not Detected
1,4-Dioxane	4.2	Not Detected	15	Not Detected
Bromodichloromethane	1.0	Not Detected	7.0	Not Detected
cis-1,3-Dichloropropene	1.0	Not Detected	4.8	Not Detected
4-Methyl-2-pentanone	1.0	Not Detected	4.3	Not Detected
Toluene	1.0	2.2	4.0	8.4
trans-1,3-Dichloropropene	1.0	Not Detected	4.8	Not Detected
1,1,2-Trichloroethane	1.0	Not Detected	5.7	Not Detected
Tetrachloroethene	1.0	Not Detected	7.1	Not Detected
2-Hexanone	4.2	Not Detected	17	Not Detected

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Client Sample ID: 184810 Ambient Air

Lab ID#: 1812594-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123119**	**Date of Collection:**	**12/19/18 2:17:00 PM**
Dil. Factor:	**2.10**	**Date of Analysis:**	**12/31/18 09:50 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.0	Not Detected	8.9	Not Detected
1,2-Dibromoethane (EDB)	1.0	Not Detected	8.1	Not Detected
Chlorobenzene	1.0	Not Detected	4.8	Not Detected
Ethyl Benzene	1.0	Not Detected	4.6	Not Detected
m,p-Xylene	1.0	Not Detected	4.6	Not Detected
o-Xylene	1.0	Not Detected	4.6	Not Detected
Styrene	1.0	Not Detected	4.5	Not Detected
Bromoform	1.0	Not Detected	11	Not Detected
Cumene	1.0	Not Detected	5.2	Not Detected
1,1,2,2-Tetrachloroethane	1.0	Not Detected	7.2	Not Detected
Propylbenzene	1.0	Not Detected	5.2	Not Detected
4-Ethyltoluene	1.0	Not Detected	5.2	Not Detected
1,3,5-Trimethylbenzene	1.0	Not Detected	5.2	Not Detected
1,2,4-Trimethylbenzene	1.0	Not Detected	5.2	Not Detected
1,3-Dichlorobenzene	1.0	Not Detected	6.3	Not Detected
1,4-Dichlorobenzene	1.0	Not Detected	6.3	Not Detected
alpha-Chlorotoluene	1.0	Not Detected	5.4	Not Detected
1,2-Dichlorobenzene	1.0	Not Detected	6.3	Not Detected
1,2,4-Trichlorobenzene	4.2	Not Detected	31	Not Detected
Hexachlorobutadiene	4.2	Not Detected	45	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	99	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1812594-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123105a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/31/18 12:26 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	5.0	Not Detected	10	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	5.0	Not Detected	19	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	5.0	Not Detected	12	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
Methyl tert-butyl ether	2.0	Not Detected	7.2	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected

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Client Sample ID: Lab Blank

Lab ID#: 1812594-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123105a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/31/18 12:26 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	0.086 J	2.4	0.42 J
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	0.41 J	21	4.4 J

J = Estimated value.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	98	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: CCV

Lab ID#: 1812594-11A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123102**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 12/31/18 10:14 AM**

Compound	%Recovery
Freon 12	112
Freon 114	111
Chloromethane	89
Vinyl Chloride	119
1,3-Butadiene	114
Bromomethane	80
Chloroethane	102
Freon 11	108
Ethanol	94
Freon 113	107
1,1-Dichloroethene	110
Acetone	111
2-Propanol	97
Carbon Disulfide	98
3-Chloropropene	97
Methylene Chloride	104
Methyl tert-butyl ether	108
trans-1,2-Dichloroethene	110
Hexane	113
1,1-Dichloroethane	105
2-Butanone (Methyl Ethyl Ketone)	98
cis-1,2-Dichloroethene	108
Tetrahydrofuran	106
Chloroform	104
1,1,1-Trichloroethane	108
Cyclohexane	108
Carbon Tetrachloride	101
2,2,4-Trimethylpentane	110
Benzene	92
1,2-Dichloroethane	104
Heptane	104
Trichloroethene	100
1,2-Dichloropropane	98
1,4-Dioxane	96
Bromodichloromethane	102
cis-1,3-Dichloropropene	99
4-Methyl-2-pentanone	97
Toluene	97
trans-1,3-Dichloropropene	100
1,1,2-Trichloroethane	100
Tetrachloroethene	110
2-Hexanone	93

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Client Sample ID: CCV

Lab ID#: 1812594-11A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123102**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 12/31/18 10:14 AM**

Compound	**%Recovery**
Dibromochloromethane	106
1,2-Dibromoethane (EDB)	103
Chlorobenzene	102
Ethyl Benzene	108
m,p-Xylene	115
o-Xylene	112
Styrene	104
Bromoform	110
Cumene	113
1,1,2,2-Tetrachloroethane	98
Propylbenzene	107
4-Ethyltoluene	111
1,3,5-Trimethylbenzene	113
1,2,4-Trimethylbenzene	115
1,3-Dichlorobenzene	110
1,4-Dichlorobenzene	113
alpha-Chlorotoluene	82
1,2-Dichlorobenzene	110
1,2,4-Trichlorobenzene	113
Hexachlorobutadiene	112

Container Type: NA - Not Applicable

Surrogates	**%Recovery**	**Method Limits**
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	109	70-130

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Client Sample ID: LCS

Lab ID#: 1812594-12A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123103**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/31/18 11:02 AM**	

Compound	%Recovery	Method Limits
Freon 12	107	70-130
Freon 114	105	70-130
Chloromethane	100	70-130
Vinyl Chloride	118	70-130
1,3-Butadiene	110	70-130
Bromomethane	100	70-130
Chloroethane	98	70-130
Freon 11	102	70-130
Ethanol	95	70-130
Freon 113	98	70-130
1,1-Dichloroethene	100	70-130
Acetone	99	70-130
2-Propanol	104	70-130
Carbon Disulfide	96	70-130
3-Chloropropene	106	70-130
Methylene Chloride	94	70-130
Methyl tert-butyl ether	101	70-130
trans-1,2-Dichloroethene	115	70-130
Hexane	106	70-130
1,1-Dichloroethane	96	70-130
2-Butanone (Methyl Ethyl Ketone)	96	70-130
cis-1,2-Dichloroethene	90	70-130
Tetrahydrofuran	105	70-130
Chloroform	99	70-130
1,1,1-Trichloroethane	103	70-130
Cyclohexane	106	70-130
Carbon Tetrachloride	106	70-130
2,2,4-Trimethylpentane	106	70-130
Benzene	92	70-130
1,2-Dichloroethane	100	70-130
Heptane	102	70-130
Trichloroethene	100	70-130
1,2-Dichloropropane	96	70-130
1,4-Dioxane	105	70-130
Bromodichloromethane	103	70-130
cis-1,3-Dichloropropene	107	70-130
4-Methyl-2-pentanone	110	70-130
Toluene	95	70-130
trans-1,3-Dichloropropene	106	70-130
1,1,2-Trichloroethane	99	70-130
Tetrachloroethene	108	70-130
2-Hexanone	115	70-130

eurofins | Air Toxics

Client Sample ID: LCS

Lab ID#: 1812594-12A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123103**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/31/18 11:02 AM**	

Compound	**%Recovery**	**Method Limits**
Dibromochloromethane	107	70-130
1,2-Dibromoethane (EDB)	106	70-130
Chlorobenzene	102	70-130
Ethyl Benzene	110	70-130
m,p-Xylene	112	70-130
o-Xylene	111	70-130
Styrene	112	70-130
Bromoform	114	70-130
Cumene	112	70-130
1,1,2,2-Tetrachloroethane	97	70-130
Propylbenzene	107	70-130
4-Ethyltoluene	118	70-130
1,3,5-Trimethylbenzene	117	70-130
1,2,4-Trimethylbenzene	117	70-130
1,3-Dichlorobenzene	110	70-130
1,4-Dichlorobenzene	114	70-130
alpha-Chlorotoluene	116	70-130
1,2-Dichlorobenzene	111	70-130
1,2,4-Trichlorobenzene	117	70-130
Hexachlorobutadiene	117	70-130

Container Type: NA - Not Applicable

Surrogates	**%Recovery**	**Method Limits**
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	101	70-130
4-Bromofluorobenzene	106	70-130

eurofins | Air Toxics

Client Sample ID: LCSD

Lab ID#: 1812594-12AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123104**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/31/18 11:27 AM**	

Compound	%Recovery	Method Limits
Freon 12	110	70-130
Freon 114	108	70-130
Chloromethane	104	70-130
Vinyl Chloride	121	70-130
1,3-Butadiene	114	70-130
Bromomethane	106	70-130
Chloroethane	99	70-130
Freon 11	107	70-130
Ethanol	99	70-130
Freon 113	101	70-130
1,1-Dichloroethene	107	70-130
Acetone	102	70-130
2-Propanol	110	70-130
Carbon Disulfide	97	70-130
3-Chloropropene	103	70-130
Methylene Chloride	98	70-130
Methyl tert-butyl ether	107	70-130
trans-1,2-Dichloroethene	119	70-130
Hexane	111	70-130
1,1-Dichloroethane	99	70-130
2-Butanone (Methyl Ethyl Ketone)	100	70-130
cis-1,2-Dichloroethene	95	70-130
Tetrahydrofuran	109	70-130
Chloroform	101	70-130
1,1,1-Trichloroethane	107	70-130
Cyclohexane	107	70-130
Carbon Tetrachloride	111	70-130
2,2,4-Trimethylpentane	109	70-130
Benzene	91	70-130
1,2-Dichloroethane	101	70-130
Heptane	107	70-130
Trichloroethene	100	70-130
1,2-Dichloropropane	98	70-130
1,4-Dioxane	106	70-130
Bromodichloromethane	104	70-130
cis-1,3-Dichloropropene	108	70-130
4-Methyl-2-pentanone	110	70-130
Toluene	97	70-130
trans-1,3-Dichloropropene	104	70-130
1,1,2-Trichloroethane	98	70-130
Tetrachloroethene	107	70-130
2-Hexanone	116	70-130

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Client Sample ID: LCSD

Lab ID#: 1812594-12AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p123104**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/31/18 11:27 AM**	

Compound	**%Recovery**	**Method Limits**
Dibromochloromethane	108	70-130
1,2-Dibromoethane (EDB)	105	70-130
Chlorobenzene	101	70-130
Ethyl Benzene	111	70-130
m,p-Xylene	111	70-130
o-Xylene	112	70-130
Styrene	114	70-130
Bromoform	112	70-130
Cumene	113	70-130
1,1,2,2-Tetrachloroethane	98	70-130
Propylbenzene	108	70-130
4-Ethyltoluene	113	70-130
1,3,5-Trimethylbenzene	116	70-130
1,2,4-Trimethylbenzene	120	70-130
1,3-Dichlorobenzene	108	70-130
1,4-Dichlorobenzene	114	70-130
alpha-Chlorotoluene	114	70-130
1,2-Dichlorobenzene	110	70-130
1,2,4-Trichlorobenzene	120	70-130
Hexachlorobutadiene	116	70-130

Container Type: NA - Not Applicable

Surrogates	**%Recovery**	**Method Limits**
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	101	70-130
4-Bromofluorobenzene	106	70-130

APPENDIX D

References

Dawson Metal Products Camdenton Facility #2
Camdenton, Mo
Site Investigation
Bachle, 2017

Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Eric R. Greitens, Governor
Carol S. Comer, Director

MEMORANDUM

DATE: September 8, 2017

TO: Amanda Branson, Environmental Specialist
Keith Brown, Environmental Specialist
Hazardous Waste Program,
Division of Environmental Quality (DEQ)

FROM: Peter Bachle, Geologist
Geological Survey Program,
Missouri Geological Survey (MGS)

STATE OF MISSOURI
BRENNA E McDONALD
REGISTERED GEOLOGIST

4 pages
0 attachments

SUBJECT: Addendum Geohydrologic Summary of Camdenton TCE Sites

LOCATION: Camdenton, Camden County, Missouri
Approximately 37.9988° North Latitude and 92.7634° West Longitude
(Dawson Metal Products Facility #2)
Approximately 38.0115° North Latitude and 92.7547° West Longitude
(Hulett Lagoon)
Approximately 37.9696° North Latitude and 92.6867° West Longitude
(Camdenton Sludge Disposal)

This is an addendum to the March 1999 geohydrologic reports for the Camdenton Sludge Disposal and Hulett Lagoon sites in addition to the recently discovered Dawson Metal Products Facility #2 site. This report is prepared in order to aid in determining optimum sampling locations and identifying potential groundwater receptors for site originated contaminants.

The primary contaminants of concern at the sites are the chlorinated solvent trichloroethylene (TCE) and the daughter products of degradation. These compounds are dense non-aqueous phase liquids (DNAPLs) that sink through the water column with very slight dissolution in water. The free product will descend deep into the aquifer while the dissolved phase plume will migrate in the down gradient direction of groundwater flow, this being due to natural gradients and water well cones of depression.

A secondary contaminant of concern is chromium. This contaminant is likely to bind with soil particles. Therefore, the extent of the chromium contamination may be limited to the unconsolidated materials at and near the disposal areas.

LOCATIONS

The three Camdenton TCE sites discussed within this document are as follows; the Dawson Metal Products Facility #2 (Dawson site) located on the north side of Highway 54 between Camdenton and the Lake of the Ozarks, the Hulett Lagoon and associated Modine site located on the west side of Camdenton, and the Camdenton Sludge Disposal site located approximately 3 miles southeast of Camdenton near the Camdenton Memorial Airport. The Dawson site is located on a ridge that has steep slopes descending to the northeast, north, and northwest. The Hulett Lagoon site is a dry lagoon located in the upper reaches of a valley that lies north of the Modine facility. The valley drains west toward the Lake of the Ozarks. The Camdenton Sludge Disposal site is located along a ridge at the southeast end of the Camdenton Memorial Airport.

GROUNDWATER PATHWAY

The Ordovician-age Gasconade Dolomite and Roubidoux Formation underlie the sites. These formations are part of the Ozark Aquifer. There are no known confining layers between the ground surface and the water table that would prevent migration of surface contaminants from reaching the aquifer at or near the location of the sites. In the case of all three locations, the bedrock has substantial secondary porosity development, or karst. The local classified losing stream segments, springs, caves, and 10- to 65-foot voids encountered in local wells attest to this.

According to drinking water well data, the water table within the Ozark Aquifer near the Dawson site lies close to the same elevation as the Lake of the Ozarks, that being between 660 to 675 feet above mean sea level (amsl). This puts the depth to groundwater for the Dawson site at 285 to 300 feet below ground surface (bgs). Based upon drinking water well data, the water table elevation beneath the Hulett Lagoon site lies somewhere between 700 and 865 feet amsl with 820 to 830 feet amsl being the most likely range near the lagoon. That places the depth to groundwater at the Hulett Lagoon site at 110 to 120 feet bgs. The elevation of groundwater near the Camdenton Sludge Disposal site lies between 765 and 790 feet amsl. That makes the depth to groundwater beneath the site range from 230 to 295 feet bgs. Since the primary site contaminants are chlorinated solvents, any wells that draw water from near the site are potential receptors. In the case of the Hulett Lagoon/Modine site, the dissolved TCE plume has been detected in the Mulberry Street public well which has a 400-foot-deep casing, a total depth of 900 feet, and lies between 740 to 1100 feet southeast of the potential source regions.

Since the bedrock in the area appears to have high karst development, the delineation of a contaminant plume may be complex. The contaminant plume may extend farther by entering cave streams, take preferential pathways and miss proximal wells, disperse laterally along more competent bedrock bedding planes, or get drawn toward high yield wells. Adding to the lateral complexity of the plume is the possible existence of domestic

wells at now-non-existent residences documented to be located at the south corner of the Dawson site property prior to 1968. Improperly abandoned wells can create preferential downward migration pathways.

Based upon static water level data from the Logmain and WIMS databases, there is a steep groundwater gradient toward the Lake of the Ozarks. Therefore, the dissolved phase of the chlorinated solvent plume most likely will migrate toward the lake. For all three site locations, the plume migration is, in general, toward the west and may impact springs that lie between the sites and the lake. In the case of the Dawson site, Cullen spring (elevation 700 feet amsl) and an unnamed spring (elevation 740 feet amsl) may be potential receptors.

The MGS drinking water well databases contain records of three municipal, one community public, one non-community public, and thirteen domestic wells within a ½-mile radius of the Camdenton TCE sites. On Table 1, Logmain well number 27877 and Public Water Supply Program well number 103793 are both associated the Camdenton municipal Blair Heights well.

Prior to 1987, registry of private wells was not required. Therefore, existing older wells may not be included in the database. Also, proper well registration may not have been submitted for some wells. Because of these exceptions, the databases may not accurately reflect all of the water usage in this area.

Figure 1 illustrates the recorded locations of the 18 known water wells within a ½-mile radius of the sites. Table 1 lists specific technical attributes (total and casing depth, static water level, date drilled, yield, etc.) of the water wells. In addition to well locations, Figure 1 illustrates the municipal water supply coverage area, county water supply district coverage area, regional groundwater elevation, classified gaining and losing stream segments, and known springs. All of these were used in determining groundwater depth, flow direction, and groundwater use for the sites.

SURFACE WATER PATHWAY

Surface water leaving the potential source area for the Dawson site flows north across the parking lot before descending the steep hill and entering a losing stream segment that drains toward the west. This stream changes to gaining near the lake level, meaning the surface water entering the ground along the losing length of the stream begins to discharge to the surface near the lake.

On August 23, 2017, Geological Survey Program (GSP) personnel were on-site at the Dawson site and observed that surface water had pooled along the southwest side of the building and was flowing into the steep valley located northwest of the building. It had been several days since the last rain fall, which indicates that the ground near the facility was saturated at the time of the site visit. It is not currently known how persistent, or whether there is, a perched water table beneath the site.

Surface water leaving the Hulett Lagoon site flows west down a steep hill, along a losing stream segment until it changes to gaining near the surface of the Lake of the Ozarks. The end of the losing segment downstream from the Hulett Lagoon site lies close to the end of the intermittent segment that is downstream of the Dawson site.

Surface water leaving the Camdenton Sludge Disposal site most likely flows to the northeast and/or southeast into classified losing stream segments. Water entering these streams will most likely enter the ground, thereby becoming groundwater, ultimately flowing west toward the lake.

RECOMMENDATIONS

Since the contaminant plume is not yet defined, it is recommended that drinking water wells located within 0.5 mile of the potential TCE disposal sites be sampled. Due to the sinking nature of the primary contaminant, surface casing may not be protective against TCE contamination. Since the recording of well data was sporadic prior to December 1986, a door-to-door well search is advisable. Due to the apparent groundwater gradient toward the Lake of the Ozarks, preferential sampling is advised to the west side of the sites. It is suggested that Cullen Spring and the unnamed spring located southwest and south of the Dawson site be sampled. If surface water still persists at the Dawson site, it is suggested that samples are taken from the valley near the northwest corner of the Dawson site building.

REFERENCES

Water Resource Program. (unpublished). *Well logs from Logmain database*. Missouri Department of Natural Resources-Directors Office.

Wellhead Protection Program. (unpublished). *Well information management system database (WIMS)*. Missouri Department of Natural Resources-Missouri Geological Survey.

Table 1: Well Data for the Camdenton TCE Sites

Water wells located within 0.5 mile of the Camdenton TCE sites.

0 to 0.5 Mile

Source	Well ID	Depth	Casing	Elev.	SWL	Date	Use	Owner	Geohydrologic Unit	Yield
Logmain	2506	330	--	980	--	1931	Domestic	Kelly	Ozark Aquifer	--
Logmain	2602	200	--	989	--	1932	Domestic	Michaux	Ozark Aquifer	--
Logmain	6264	97	--	930	--	1940	Domestic	Reed	Ozark Aquifer	--
Logmain	21330	335	63	979	175	1962	Domestic	Bevan	Ozark Aquifer	--
Logmain	27877	1060	400	1010	315	1974	Municipal	Camdenton Well #4 (Blair Hts)	Ozark Aquifer	300
Logmain	27880	848	--	1060	--	--	Community Public	Camden Co PWSD #2 Well #1	Ozark Aquifer	--
Logmain	28356	1100	435	1042	246	1980	Municipal	Camdenton Well #5	Ozark Aquifer	--
WIMS	52609	395	148	--	210	1991	Domestic	--	Ozark Aquifer	30
WIMS	68392	400	220	984	220	1991	Domestic	--	Ozark Aquifer	30
WIMS	84612	420	100	--	210	1992	Domestic	--	Ozark Aquifer	30
PDWP	103791	900	400	--	95	1986	Municipal	Camdenton (Mulberry)	Ozark Aquifer	600
PDWP	103793	1045	400	--	315	1974	Municipal	Camdenton (Blair Hts)	Ozark Aquifer	100
PDWP	105015	--	--	1060	--	--	Non-Community Public	Speedline Technologies Inc.	Ozark Aquifer	--
WIMS	189083	433	80	--	245	1997	Domestic	--	Ozark Aquifer	30
WIMS	255044	340	100	--	90	2000	Domestic	--	Ozark Aquifer	50
WIMS	271405	231	120	--	0	2000	Domestic	--	Ozark Aquifer	40
WIMS	288266	395	160	--	233	2003	Domestic	--	Ozark Aquifer	25
WIMS	296521	450	118	--	285	2004	Domestic	--	Ozark Aquifer	28
WIMS	368177	420	160	--	270	2006	Domestic	--	Ozark Aquifer	20

Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Eric R. Greitens, Governor
Carol S. Comer, Director

MEMORANDUM

DATE: September 13, 2017

TO: Amanda Branson, Environmental Specialist,
Hazardous Waste Program,
Division of Environmental Quality (DEQ)

FROM: Peter Bachle, Geologist
Geological Survey Program,
Missouri Geological Survey (MGS)

STATE OF MISSOURI
BRENNA E. McDONALD
REGISTERED GEOLOGIST

1 page w/ attachments
9/13/17

SUBJECT: Four-Mile Well Survey for the Dawson Metal Products Facility #2 Site

LOCATION: SW ¼. SE ¼ Section 26, Township 38 North, Range 17 West, Hahatonka 7.5-Minute Quadrangle, Camden County, Missouri
Approximately 37.9988° North Latitude and 92.7634° West Longitude

FOUR-MILE WELL SURVEY

The Public Drinking Water Program (PDWP) public well, Wellhead Protection Section's Well Information Management System (WIMS), and the Logamin well log databases were assessed in order to determine the wells that are currently known to exist within 4 miles of the Dawson Metal Products Facility #2 site. Based upon the available information, there 510 known wells located within 4 miles of the site. There are records of six municipal, 29 community public, 18 non-community public, and 457 domestic wells within a 4-mile radius of the site. The nearest domestic drinking water well on record is located approximately 0.17 mile southeast of the site. The nearest public well on record is located approximately 0.25 mile northeast of the site.

Figure 2 illustrates the recorded locations of the 510 known water wells within a 4-mile radius of the site. Table 2 lists specific technical attributes (total and casing depth, static water level, date drilled, yield, etc.) of the water wells

Table 2: Well Data for the Dawson Metal Products Facility #2 Site

Water wells located within 4 miles of the Dawson Metal Prodiucts Facility #2 site.

0 to 0.25 Mile

Source	Well ID	Depth	Casing	Elev.	SWL	Date	Use	Owner	Geohydrologic Unit	Yield
WIMS	271405	231	120	--	0	2000	Domestic	--	Ozark Aquifer	40
PDWP	103793	1045	400	--	315	1974	Municipal	Camdenton (Blair Hts)	Ozark Aquifer	100

Wells found within 0 to 0.25 mile of the site: 2

0.25 to 0.5 Mile

Source	Well ID	Depth	Casing	Elev.	SWL	Date	Use	Owner	Geohydrologic Unit	Yield
WIMS	288266	395	160	--	233	2003	Domestic	--	Ozark Aquifer	25
Logmain	2506	330	--	980	--	1931	Domestic	Kelly	Ozark Aquifer	--
Logmain	2602	200	--	989	--	1932	Domestic	Michaux	Ozark Aquifer	--
Logmain	6264	97	--	930	--	1940	Domestic	Reed	Ozark Aquifer	--

Wells found within 0.25 to 0.5 mile of the site: 4

0.5 to 1 Mile

Source	Well ID	Depth	Casing	Elev.	SWL	Date	Use	Owner	Geohydrologic Unit	Yield
PDWP	103791	900	400	--	95	1986	Municipal	Camdenton (Mulberry)	Ozark Aquifer	600
PDWP	105313	670	403	840	170	2005	Community Public	Forest Ridge Subdivision	Ozark Aquifer	120
WIMS	84612	420	100	--	210	1992	Domestic	--	Ozark Aquifer	30
WIMS	236448	290	150	--	--	1998	Domestic	--	Ozark Aquifer	30
WIMS	377632	325	81	--	180	2006	Domestic	--	Ozark Aquifer	25
WIMS	404040	360	100	--	245	2007	Domestic	--	Ozark Aquifer	35
WIMS	441798	305	103	--	120	2010	Domestic	--	Ozark Aquifer	25

Wells found within 0.5 to 1 mile of the site: 7

1 to 2 Miles

Source	Well ID	Depth	Casing	Elev.	SWL	Date	Use	Owner	Geohydrologic Unit	Yield
PDWP	101379	200	--	--	--	1963	Non-community Public	Old Kinderhook Resort & Marina	Ozark Aquifer	--
PDWP	101380	--	--	--	--	--	Non-community Public	Tonka Villa Resort	Ozark Aquifer	--
PDWP	101383	300	150	--	--	1984	Community Public	Lake Valley Condo	Ozark Aquifer	--
PDWP	101387	140	20	--	20	1973	Non-community Public	Rippling Waters Resort	Ozark Aquifer	25
PDWP	101967	350	80	--	63	1978	Non-community Public	Adam's Ale Resort, Inc.	Ozark Aquifer	--
PDWP	102042	300	147	--	--	1984	Community Public	Lake Valley Condo	Ozark Aquifer	--
PDWP	102043	340	147	--	--	1985	Community Public	Lake Valley Condo	Ozark Aquifer	--
PDWP	102044	340	147	--	--	1985	Community Public	Lake Valley Condo	Ozark Aquifer	--
PDWP	102085	150	20	--	30	1982	Non-community Public	Rippling Waters Resort	Ozark Aquifer	25
PDWP	102664	425	410	--	110	1991	Community Public	Minnowbrook Estates	Ozark Aquifer	97
PDWP	102870	--	--	--	--	--	Community Public	Cedar Glen Condo	Ozark Aquifer	--
PDWP	103491	590	425	--	--	1999	Non-community Public	St. Anthony's Catholic Church	Ozark Aquifer	--
PDWP	103792	940	450	--	254	1961	Municipal	Camdenton	Ozark Aquifer	380

Water wells located within 4 miles of Dawson Metal Products Facility #2 site.

Source	Well ID	Depth	Casing	Elev.	SWL	Date	Use	Owner	Geohydrologic Unit	Yield
PDWP	103930	--	--	--	--	--	Community Public	Grand View Condo	Ozark Aquifer	--
PDWP	103931	610	400	690	90	2004	Non-community Public	Cedar Green Land Acquisition LLC	Ozark Aquifer	--
PDWP	103980	--	--	--	--	--	Non-community Public	Lake Dental Clinic	Ozark Aquifer	--
PDWP	103985	--	350	--	--	--	Non-community Public	Ha Ha Tonka State Park	Ozark Aquifer	--
PDWP	104077	1100	463	--	260	1998	Municipal	Camdenton	Ozark Aquifer	550
PDWP	104078	610	278	1023	365	2000	Non-community Public	Der Essen Platz	Ozark Aquifer	30
PDWP	105149	445	280	--	60	2003	Community Public	Camden Co. PWSD #5 - Cedar Hts HOA	Ozark Aquifer	100
PDWP	105277	--	--	--	--	--	Community Public	Niangua Point Water Assoc	Ozark Aquifer	--
PDWP	105306	680	470	--	190	2005	Community Public	Niangua Highlands Estates	Ozark Aquifer	150
PDWP	105365	615	306	720	80	2007	Community Public	Hyd-A-Way Condo	Ozark Aquifer	180
PDWP	105584	735	420	890	140	2007	Community Public	Arbor Glen Townhomes	Ozark Aquifer	--
PDWP	105928	--	--	--	--	--	Community Public	Green Acres MHP	Ozark Aquifer	--
PDWP	106319	--	--	--	--	--	Community Public	J Bar H Estates	Ozark Aquifer	--
PDWP	106605	1500	425	1025	285	2011	Community Public	Camdenton	Ozark Aquifer	500
WIMS	2067	360	126	--	220	1987	Domestic	--	Ozark Aquifer	30
WIMS	2249	420	147	--	215	1987	Domestic	--	Ozark Aquifer	30
WIMS	4060	400	105	--	200	1987	Domestic	--	Ozark Aquifer	30
WIMS	5182	198	84	685	38	1987	Domestic	--	Ozark Aquifer	20
WIMS	5184	175	170	--	15	1987	Domestic	--	Ozark Aquifer	40
WIMS	5951	340	105	--	145	1987	Domestic	--	Ozark Aquifer	30
WIMS	6144	--	--	--	--	1988	Domestic	--	Ozark Aquifer	--
WIMS	7306	530	210	--	65	1988	Domestic	--	Ozark Aquifer	75
WIMS	11103	--	--	--	--	1988	Domestic	--	Ozark Aquifer	--
WIMS	24532	380	220	787	165	2005	Domestic	--	Ozark Aquifer	30
WIMS	24552	260	120	--	30	2005	Domestic	--	Ozark Aquifer	30
WIMS	26787	343	105	--	60	1989	Domestic	--	Ozark Aquifer	35
WIMS	33740	158	90	660	10	1989	Domestic	--	Ozark Aquifer	20
WIMS	33796	218	--	--	--	1990	Domestic	--	Ozark Aquifer	--
WIMS	34711	260	105	669	20	1990	Domestic	--	Ozark Aquifer	25
WIMS	34716	240	105	669	8	1990	Domestic	--	Ozark Aquifer	--
WIMS	43289	100	--	--	--	--	Domestic	--	Ozark Aquifer	--
WIMS	46891	498	122	--	325	1993	Domestic	--	Ozark Aquifer	18
WIMS	47249	200	--	--	--	1990	Domestic	--	Ozark Aquifer	--
WIMS	52590	250	175	708	60	1990	Domestic	--	Ozark Aquifer	55
WIMS	52595	151	80	669	10	1990	Domestic	--	Ozark Aquifer	25
WIMS	52626	231	110	710	65	1993	Domestic	--	Ozark Aquifer	25
WIMS	52628	210	120	--	35	1992	Domestic	--	Ozark Aquifer	30
WIMS	52656	210	100	--	35	1992	Domestic	--	Ozark Aquifer	20
WIMS	54310	240	120	660	35	1990	Domestic	--	Ozark Aquifer	30
WIMS	54311	220	119	720	30	1990	Domestic	--	Ozark Aquifer	30
WIMS	54495	407	105	--	--	1990	Domestic	--	Ozark Aquifer	--
WIMS	57439	468	190	--	240	1990	Domestic	--	Ozark Aquifer	25
WIMS	59221	215	106	690	22	1990	Domestic	--	Ozark Aquifer	25
WIMS	62723	380	102	--	265	1991	Domestic	--	Ozark Aquifer	30

Water wells located within 4 miles of Dawson Metal Products Facility #2 site.

Source	Well ID	Depth	Casing	Elev.	SWL	Date	Use	Owner	Geohydrologic Unit	Yield
WIMS	62770	175	107	689	22	1991	Domestic	--	Ozark Aquifer	30
WIMS	64821	475	153	730	78	1994	Domestic	--	Ozark Aquifer	25
WIMS	66010	260	121	--	12	1992	Domestic	--	Ozark Aquifer	30
WIMS	68392	400	220	984	220	1991	Domestic	--	Ozark Aquifer	30
WIMS	68405	198	100	680	15	1991	Domestic	--	Ozark Aquifer	20
WIMS	77771	200	140	660	23	1992	Domestic	--	Ozark Aquifer	25
WIMS	91365	195	140	689	42	1993	Domestic	--	Ozark Aquifer	30
WIMS	91425	200	140	698	18	1993	Domestic	--	Ozark Aquifer	20
WIMS	96827	178	14	--	23	1993	Domestic	--	Ozark Aquifer	15
WIMS	96841	340	220	787	125	1994	Domestic	--	Ozark Aquifer	40
WIMS	120553	520	250	--	350	1994	Domestic	--	Ozark Aquifer	25
WIMS	120852	235	174	--	80	1994	Domestic	--	Ozark Aquifer	25
WIMS	120854	210	100	770	20	1995	Domestic	--	Ozark Aquifer	25
WIMS	120868	293	110	--	140	1994	Domestic	--	Ozark Aquifer	25
WIMS	133989	--	--	--	--	1996	Domestic	--	Ozark Aquifer	--
WIMS	133995	--	--	718	--	1999	Domestic	--	Ozark Aquifer	--
WIMS	138060	380	80	970	240	1996	Domestic	--	Ozark Aquifer	20
WIMS	154628	198	100	--	15	1996	Domestic	--	Ozark Aquifer	20
WIMS	158044	340	102	--	140	1996	Domestic	--	Ozark Aquifer	20
WIMS	158050	160	102	669	20	1996	Domestic	--	Ozark Aquifer	20
WIMS	173794	220	143	--	30	1992	Domestic	--	Ozark Aquifer	35
WIMS	181046	180	82	679	7	1997	Domestic	--	Ozark Aquifer	25
WIMS	181053	240	102	669	10	1998	Domestic	--	Ozark Aquifer	30
WIMS	186114	320	142	--	20	1997	Domestic	--	Ozark Aquifer	65
WIMS	190879	230	160	--	20	1997	Domestic	--	Ozark Aquifer	--
WIMS	209923	200	100	680	14	1998	Domestic	--	Ozark Aquifer	35
WIMS	209950	480	100	886	305	1999	Domestic	--	Ozark Aquifer	25
WIMS	214491	210	110	--	25	1999	Domestic	--	Ozark Aquifer	25
WIMS	221501	380	100	820	135	1999	Domestic	--	Ozark Aquifer	35
WIMS	226765	200	140	660	8	1999	Domestic	--	Ozark Aquifer	35
WIMS	226767	240	120	660	5	1999	Domestic	--	Ozark Aquifer	30
WIMS	226929	160	100	680	14	2000	Domestic	--	Ozark Aquifer	30
WIMS	236461	210	120	--	20	1998	Domestic	--	Ozark Aquifer	30
WIMS	237699	240	120	669	40	1999	Domestic	--	Ozark Aquifer	25
WIMS	255978	355	100	--	195	1997	Domestic	--	Ozark Aquifer	20
WIMS	263702	260	--	730	--	2001	Domestic	--	Ozark Aquifer	--
WIMS	272244	200	80	--	20	2001	Domestic	--	Ozark Aquifer	50
WIMS	272255	280	80	900	140	2001	Domestic	--	Ozark Aquifer	35
WIMS	274477	320	100	787	105	2003	Domestic	--	Ozark Aquifer	20
WIMS	278445	495	100	--	320	2002	Domestic	--	Ozark Aquifer	20
WIMS	278464	250	--	689	--	2001	Domestic	--	Ozark Aquifer	--
WIMS	282983	340	80	--	180	2001	Domestic	--	Ozark Aquifer	25
WIMS	282986	320	80	--	192	2002	Domestic	--	Ozark Aquifer	25
WIMS	282996	400	80	900	172	2001	Domestic	--	Ozark Aquifer	50

Water wells located within 4 miles of Dawson Metal Products Facility #2 site.

Source	Well ID	Depth	Casing	Elev.	SWL	Date	Use	Owner	Geohydrologic Unit	Yield
WIMS	291162	--	--	--	--	2005	Domestic	--	Ozark Aquifer	--
WIMS	291169	--	--	--	20	2006	Domestic	--	Ozark Aquifer	--
WIMS	292668	--	--	--	40	2015	Domestic	--	Ozark Aquifer	--
WIMS	296528	230	129	--	90	2003	Domestic	--	Ozark Aquifer	50
WIMS	304227	--	--	--	10	2007	Domestic	--	Ozark Aquifer	--
WIMS	304229	--	--	--	25	2007	Domestic	--	Ozark Aquifer	--
WIMS	309084	370	84	826	156	2003	Domestic	--	Ozark Aquifer	35
WIMS	321096	230	100	--	15	2003	Domestic	--	Ozark Aquifer	40
WIMS	321250	210	80	--	25	2004	Domestic	--	Ozark Aquifer	35
WIMS	321656	340	120	900	179	2003	Domestic	--	Ozark Aquifer	30
WIMS	321663	220	100	660	6	2003	Domestic	--	Ozark Aquifer	30
WIMS	321704	360	100	984	185	2003	Domestic	--	Ozark Aquifer	18
WIMS	322920	190	120	--	35	2003	Domestic	--	Ozark Aquifer	35
WIMS	322921	210	120	--	20	2003	Domestic	--	Ozark Aquifer	35
WIMS	326986	150	80	--	15	2003	Domestic	--	Ozark Aquifer	30
WIMS	330307	285	81	880	160	2004	Domestic	--	Ozark Aquifer	35
WIMS	335216	210	100	--	25	2004	Domestic	--	Ozark Aquifer	25
WIMS	338696	520	80	--	280	2004	Domestic	--	Ozark Aquifer	35
WIMS	349614	140	120	--	15	2005	Domestic	--	Ozark Aquifer	40
WIMS	355282	500	80	--	267	2005	Domestic	--	Ozark Aquifer	35
WIMS	356284	280	140	--	32	2006	Domestic	--	Ozark Aquifer	60
WIMS	366951	190	100	--	20	2006	Domestic	--	Ozark Aquifer	25
WIMS	368143	200	120	--	6	2006	Domestic	--	Ozark Aquifer	60
WIMS	376955	205	101	--	60	2007	Domestic	--	Ozark Aquifer	25
WIMS	403194	240	120	--	10	2007	Domestic	--	Ozark Aquifer	25
WIMS	404037	170	100	--	6	2007	Domestic	--	Ozark Aquifer	30
WIMS	404038	260	200	--	80	2007	Domestic	--	Ozark Aquifer	40
WIMS	404104	200	100	--	10	2008	Domestic	--	Ozark Aquifer	20
WIMS	418269	235	95	--	25	2008	Domestic	--	Ozark Aquifer	30
WIMS	420935	247	141	--	30	2009	Domestic	--	Ozark Aquifer	40
WIMS	433594	220	121	--	4	2008	Domestic	--	Ozark Aquifer	20
WIMS	441823	300	80	--	20	2010	Domestic	--	Ozark Aquifer	30
WIMS	441850	250	80	--	20	2009	Domestic	--	Ozark Aquifer	25
WIMS	441901	285	150	--	80	2010	Domestic	--	Ozark Aquifer	35
WIMS	441935	365	82	--	250	2010	Domestic	--	Ozark Aquifer	35
WIMS	459948	405	83	--	120	2012	Domestic	--	Ozark Aquifer	30
WIMS	468206	195	95	--	25	2012	Domestic	--	Ozark Aquifer	35
WIMS	477124	255	95	--	30	2013	Domestic	--	Ozark Aquifer	30
WIMS	491166	305	103	--	25	2014	Domestic	--	Ozark Aquifer	40
Logmain	7789	494	--	1026	--	1942	Domestic	Dunn	Ozark Aquifer	--
Logmain	21330	335	--	979	175	1962	Domestic	Bevan	Ozark Aquifer	--

Wells found within 1 to 2 miles of the site: 142

2 to 3 Miles

Source	Well ID	Depth	Casing	Elev.	SWL	Date	Use	Owner	Geohydrologic Unit	Yield
PDWP	101384	550	250	--	75	1967	Non-community Public	Lake Valley Country Club	Ozark Aquifer	90
PDWP	102556	615	315	--	204	1997	Community Public	Old Kinderhook Community	Ozark Aquifer	120
PDWP	102557	700	300	--	60	1997	Community Public	Old Kinderhook Community	Ozark Aquifer	--
PDWP	103790	600	400	--	165	1969	Community Public	Windsor Estates Nursing Home	Ozark Aquifer	--
PDWP	103794	550	350	--	175	1970	Community Public	Southway Terrace MHP	Ozark Aquifer	--
PDWP	103929	--	--	--	--	1949	Non-community Public	Bridal Cave	Ozark Aquifer	100
PDWP	105190	800	400	--	--	--	Community Public	Villas of Shadow Crest	Ozark Aquifer	--
PDWP	105191	--	--	--	--	--	Community Public	Watkins Subdivision	Ozark Aquifer	--
PDWP	105450	--	--	--	--	--	Community Public	Hickory Village	Ozark Aquifer	--
PDWP	105575	--	--	--	--	--	Non-community Public	Van Hook Bait & Tackle	Ozark Aquifer	--
PDWP	106507	--	--	--	--	--	Community Public	Woodbridge Subdivision	Ozark Aquifer	--
WIMS	624	138	82	--	50	1987	Domestic	--	Ozark Aquifer	25
WIMS	1307	138	103	--	15	1987	Domestic	--	Ozark Aquifer	20
WIMS	1841	380	305	--	225	1987	Domestic	--	Ozark Aquifer	30
WIMS	2012	260	84	--	90	1987	Domestic	--	Ozark Aquifer	20
WIMS	5180	282	84	--	120	1987	Domestic	--	Ozark Aquifer	20
WIMS	5246	195	105	--	30	1988	Domestic	--	Ozark Aquifer	30
WIMS	5948	217	88	--	--	1987	Domestic	--	Ozark Aquifer	30
WIMS	5999	178	105	--	25	1987	Domestic	--	Ozark Aquifer	20
WIMS	6000	218	147	--	60	1987	Domestic	--	Ozark Aquifer	25
WIMS	8724	477	87	--	260	1988	Domestic	--	Ozark Aquifer	22
WIMS	9625	240	110	--	30	1988	Domestic	--	Ozark Aquifer	18
WIMS	11741	260	84	--	90	1987	Domestic	--	Ozark Aquifer	20
WIMS	12040	385	83	--	200	1988	Domestic	--	Ozark Aquifer	37
WIMS	12651	178	105	680	20	1989	Domestic	--	Ozark Aquifer	20
WIMS	14191	725	235	1045	370	1987	Domestic	--	Ozark Aquifer	35
WIMS	15206	343	103	--	140	1989	Domestic	--	Ozark Aquifer	25
WIMS	15367	170	108	--	--	1989	Domestic	--	Ozark Aquifer	30
WIMS	15368	210	87	--	30	1989	Domestic	--	Ozark Aquifer	12
WIMS	16656	467	166	--	280	1989	Domestic	--	Ozark Aquifer	20
WIMS	18989	240	120	669	20	1996	Domestic	--	Ozark Aquifer	30
WIMS	24547	380	180	--	189	2005	Domestic	--	Ozark Aquifer	60
WIMS	24573	220	120	689	21	2005	Domestic	--	Ozark Aquifer	30
WIMS	26793	198	190	720	--	1990	Domestic	--	Ozark Aquifer	60
WIMS	35881	210	100	820	90	1991	Domestic	--	Ozark Aquifer	25
WIMS	43849	178	--	680	--	1990	Domestic	--	Ozark Aquifer	--
WIMS	44398	410	80	--	250	1989	Domestic	--	Ozark Aquifer	25
WIMS	44602	380	139	--	205	1989	Domestic	--	Ozark Aquifer	25
WIMS	44623	200	126	690	43	1989	Domestic	--	Ozark Aquifer	20
WIMS	44635	220	126	670	62	1989	Domestic	--	Ozark Aquifer	30
WIMS	46869	353	106	--	245	1990	Domestic	--	Ozark Aquifer	15
WIMS	46879	233	140	689	40	1991	Domestic	--	Ozark Aquifer	40
WIMS	47228	235	140	728	45	1990	Domestic	--	Ozark Aquifer	30
WIMS	47246	191	130	708	28	1990	Domestic	--	Ozark Aquifer	50

Water wells located within 4 miles of Dawson Metal Products Facility #2 site.

Source	Well ID	Depth	Casing	Elev.	SWL	Date	Use	Owner	Geohydrologic Unit	Yield
WIMS	52650	291	80	--	140	1992	Domestic	--	Ozark Aquifer	25
WIMS	54516	407	168	--	220	1990	Domestic	--	Ozark Aquifer	40
WIMS	57058	210	100	--	55	1994	Domestic	--	Ozark Aquifer	30
WIMS	58354	360	126	--	205	1990	Domestic	--	Ozark Aquifer	20
WIMS	62755	178	--	720	--	1991	Domestic	--	Ozark Aquifer	--
WIMS	66002	260	182	--	90	1992	Domestic	--	Ozark Aquifer	25
WIMS	68399	200	100	669	18	1991	Domestic	--	Ozark Aquifer	20
WIMS	77405	375	80	940	240	1993	Domestic	--	Ozark Aquifer	25
WIMS	88177	210	82	--	90	1992	Domestic	--	Ozark Aquifer	25
WIMS	91288	170	103	660	--	1993	Domestic	--	Ozark Aquifer	50
WIMS	91289	250	103	--	23	1993	Domestic	--	Ozark Aquifer	20
WIMS	91290	170	103	--	--	1993	Domestic	--	Ozark Aquifer	30
WIMS	96836	240	160	680	50	1994	Domestic	--	Ozark Aquifer	30
WIMS	104355	--	--	--	--	1994	Domestic	--	Ozark Aquifer	--
WIMS	108317	460	106	984	305	1994	Domestic	--	Ozark Aquifer	20
WIMS	108321	300	100	900	70	1994	Domestic	--	Ozark Aquifer	25
WIMS	108324	460	100	836	260	1994	Domestic	--	Ozark Aquifer	15
WIMS	108332	280	100	--	102	1994	Domestic	--	Ozark Aquifer	20
WIMS	108341	260	160	722	30	1995	Domestic	--	Ozark Aquifer	18
WIMS	120258	200	104	720	35	1994	Domestic	--	Ozark Aquifer	25
WIMS	120260	180	120	--	15	--	Domestic	--	Ozark Aquifer	20
WIMS	120261	320	82	--	160	1994	Domestic	--	Ozark Aquifer	25
WIMS	120573	300	120	760	100	1994	Domestic	--	Ozark Aquifer	30
WIMS	120860	352	80	--	170	1994	Domestic	--	Ozark Aquifer	20
WIMS	138033	250	165	698	95	1995	Domestic	--	Ozark Aquifer	25
WIMS	138034	210	143	--	35	1995	Domestic	--	Ozark Aquifer	30
WIMS	157532	460	100	--	240	1996	Domestic	--	Ozark Aquifer	20
WIMS	157738	310	220	240	100	1997	Domestic	--	Ozark Aquifer	25
WIMS	173813	260	110	--	35	1997	Domestic	--	Ozark Aquifer	30
WIMS	181029	240	102	669	25	1997	Domestic	--	Ozark Aquifer	40
WIMS	182558	340	100	--	120	1997	Domestic	--	Ozark Aquifer	15
WIMS	185530	360	100	850	195	1997	Domestic	--	Ozark Aquifer	20
WIMS	186131	260	104	--	--	1998	Domestic	--	Ozark Aquifer	30
WIMS	189074	415	100	--	195	1997	Domestic	--	Ozark Aquifer	35
WIMS	190850	280	82	--	95	1998	Domestic	--	Ozark Aquifer	60
WIMS	192241	360	80	--	200	1998	Domestic	--	Ozark Aquifer	--
WIMS	209888	280	100	--	150	2000	Domestic	--	Ozark Aquifer	25
WIMS	209926	220	80	--	95	1998	Domestic	--	Ozark Aquifer	25
WIMS	210520	300	100	760	160	1998	Domestic	--	Ozark Aquifer	25
WIMS	213427	241	80	760	120	1999	Domestic	--	Ozark Aquifer	30
WIMS	213432	200	100	--	15	1999	Domestic	--	Ozark Aquifer	25
WIMS	213437	609	122	--	400	1999	Domestic	--	Ozark Aquifer	20
WIMS	214479	245	160	--	55	1999	Domestic	--	Ozark Aquifer	35
WIMS	214495	270	80	--	135	1999	Domestic	--	Ozark Aquifer	20

Water wells located within 4 miles of Dawson Metal Products Facility #2 site.

Source	Well ID	Depth	Casing	Elev.	SWL	Date	Use	Owner	Geohydrologic Unit	Yield
WIMS	221966	400	120	1080	--	2000	Domestic	--	Ozark Aquifer	35
WIMS	226003	210	101	700	30	1999	Domestic	--	Ozark Aquifer	30
WIMS	246744	--	--	--	--	2003	Domestic	--	Ozark Aquifer	--
WIMS	252739	380	242	1000	230	2000	Domestic	--	Ozark Aquifer	30
WIMS	252752	375	169	964	172	2000	Domestic	--	Ozark Aquifer	40
WIMS	252914	440	180	1020	250	2002	Domestic	--	Ozark Aquifer	28
WIMS	252917	180	100	660	1	2002	Domestic	--	Ozark Aquifer	20
WIMS	253285	360	180	760	112	2001	Domestic	--	Ozark Aquifer	30
WIMS	255042	320	80	807	120	2000	Domestic	--	Ozark Aquifer	30
WIMS	255043	220	120	--	23	2001	Domestic	--	Ozark Aquifer	35
WIMS	263077	333	180	--	190	2001	Domestic	--	Ozark Aquifer	25
WIMS	263747	260	120	689	40	2000	Domestic	--	Ozark Aquifer	30
WIMS	272185	240	110	680	40	2001	Domestic	--	Ozark Aquifer	25
WIMS	272250	300	100	--	120	2001	Domestic	--	Ozark Aquifer	35
WIMS	274428	300	140	820	96	2002	Domestic	--	Ozark Aquifer	30
WIMS	274453	400	240	780	115	2002	Domestic	--	Ozark Aquifer	30
WIMS	274529	480	291	984	240	2001	Domestic	--	Ozark Aquifer	30
WIMS	278455	270	119	--	70	2002	Domestic	--	Ozark Aquifer	25
WIMS	278472	310	80	--	110	2001	Domestic	--	Ozark Aquifer	20
WIMS	278488	230	80	--	45	2001	Domestic	--	Ozark Aquifer	25
WIMS	287057	268	121	690	--	2002	Domestic	--	Ozark Aquifer	30
WIMS	288267	270	106	--	145	2003	Domestic	--	Ozark Aquifer	25
WIMS	293085	445	80	--	273	2006	Domestic	--	Ozark Aquifer	35
WIMS	293093	220	120	689	22	2002	Domestic	--	Ozark Aquifer	40
WIMS	309067	220	120	689	28	2003	Domestic	--	Ozark Aquifer	35
WIMS	310108	400	178	708	97	2005	Domestic	--	Ozark Aquifer	30
WIMS	321160	310	120	--	109	2003	Domestic	--	Ozark Aquifer	25
WIMS	321673	300	120	866	118	2003	Domestic	--	Ozark Aquifer	30
WIMS	321676	320	140	700	41	2003	Domestic	--	Ozark Aquifer	60
WIMS	321677	300	140	720	40	2003	Domestic	--	Ozark Aquifer	40
WIMS	326619	190	80	--	55	2003	Domestic	--	Ozark Aquifer	20
WIMS	326981	220	80	--	15	2003	Domestic	--	Ozark Aquifer	30
WIMS	327006	250	80	--	20	2003	Domestic	--	Ozark Aquifer	35
WIMS	329346	267	121	689	50	2004	Domestic	--	Ozark Aquifer	30
WIMS	330305	305	81	--	140	2005	Domestic	--	Ozark Aquifer	35
WIMS	332763	460	140	920	200	2004	Domestic	--	Ozark Aquifer	40
WIMS	334132	207	101	748	30	2004	Domestic	--	Ozark Aquifer	30
WIMS	334432	210	100	--	35	2004	Domestic	--	Ozark Aquifer	35
WIMS	334826	405	81	--	240	2005	Domestic	--	Ozark Aquifer	25
WIMS	347066	290	80	--	150	2005	Domestic	--	Ozark Aquifer	35
WIMS	347071	220	147	--	30	2005	Domestic	--	Ozark Aquifer	30
WIMS	355277	340	160	--	49	2005	Domestic	--	Ozark Aquifer	40
WIMS	356018	225	121	689	35	2005	Domestic	--	Ozark Aquifer	45
WIMS	365704	300	120	--	30	2005	Domestic	--	Ozark Aquifer	50

Water wells located within 4 miles of Dawson Metal Products Facility #2 site.

Source	Well ID	Depth	Casing	Elev.	SWL	Date	Use	Owner	Geohydrologic Unit	Yield
WIMS	368146	260	140	--	42	2006	Domestic	--	Ozark Aquifer	30
WIMS	368188	440	140	--	242	2006	Domestic	--	Ozark Aquifer	40
WIMS	369209	287	121	--	20	2006	Domestic	--	Ozark Aquifer	30
WIMS	375750	446	81	--	300	2005	Domestic	--	Ozark Aquifer	25
WIMS	380184	250	175	--	80	2007	Domestic	--	Ozark Aquifer	30
WIMS	380365	267	121	--	30	2007	Domestic	--	Ozark Aquifer	30
WIMS	403183	200	120	--	2	2007	Domestic	--	Ozark Aquifer	40
WIMS	403192	260	120	--	25	2007	Domestic	--	Ozark Aquifer	40
WIMS	404535	245	82	--	100	2007	Domestic	--	Ozark Aquifer	30
WIMS	417132	405	102	--	160	2007	Domestic	--	Ozark Aquifer	65
WIMS	418021	205	83	--	30	2008	Domestic	--	Ozark Aquifer	30
WIMS	432810	460	180	--	280	2009	Domestic	--	Ozark Aquifer	25
WIMS	433912	260	80	--	12	2008	Domestic	--	Ozark Aquifer	25
WIMS	433913	250	80	--	40	2008	Domestic	--	Ozark Aquifer	35
WIMS	441786	225	122	--	25	2009	Domestic	--	Ozark Aquifer	30
WIMS	441827	330	105	--	180	2010	Domestic	--	Ozark Aquifer	25
WIMS	441831	250	80	--	60	2010	Domestic	--	Ozark Aquifer	25
WIMS	441902	245	122	--	30	2010	Domestic	--	Ozark Aquifer	25
WIMS	459876	505	180	--	180	2011	Domestic	--	Ozark Aquifer	45
WIMS	459912	245	83	--	80	2012	Domestic	--	Ozark Aquifer	20
WIMS	477146	395	255	--	170	2013	Domestic	--	Ozark Aquifer	30
WIMS	479322	260	140	--	28	2014	Domestic	--	Ozark Aquifer	25
WIMS	491172	525	143	--	40	2014	Domestic	--	Ozark Aquifer	120
WIMS	492197	380	120	--	180	2015	Domestic	--	Ozark Aquifer	25
WIMS	492498	405	247	--	140	2015	Domestic	--	Ozark Aquifer	35
WIMS	496237	590	82	898	130	2015	Domestic	--	Ozark Aquifer	40
WIMS	505503	227	81	--	45	2015	Domestic	--	Ozark Aquifer	--
WIMS	513954	480	220	--	134	2016	Domestic	--	Ozark Aquifer	40
WIMS	514203	406	140	--	230	2016	Domestic	--	Ozark Aquifer	30
Logmain	2649	367	--	1065	--	1932	Domestic	Collins	Ozark Aquifer	--
Logmain	6568	70	--	671	--	1940	Domestic	Scott,	Ozark Aquifer	--
Logmain	13619	105	--	996	--	1955	Domestic	Scott	Ozark Aquifer	--
Logmain	14093	570	--	990	195	1955	Domestic	Scott	Ozark Aquifer	--
Logmain	19602	376	--	840	155	1961	Domestic	Huber	Ozark Aquifer	--

Wells found within 2 to 3 miles of the site: 166

3 to 4 Miles

Source	Well ID	Depth	Casing	Elev.	SWL	Date	Use	Owner	Geohydrologic Unit	Yield
PDWP	102242	--	86	--	--	--	Non-community Public	New Tribes Mission Inc	Ozark Aquifer	--
PDWP	102243	--	--	--	--	--	Non-community Public	New Tribes Mission Inc	Ozark Aquifer	--
PDWP	103002	300	150	--	20	1984	Non-community Public	Clearwater Resort	Ozark Aquifer	30
PDWP	103003	--	--	--	--	--	Non-community Public	Clearwater Resort	Ozark Aquifer	--
PDWP	103074	--	350	--	--	1988	Community Public	Oak Bluff Condominiums	Ozark Aquifer	--
PDWP	103364	--	--	--	--	--	Municipal	Linn Creek	Ozark Aquifer	--

Water wells located within 4 miles of Dawson Metal Products Facility #2 site.

Source	Well ID	Depth	Casing	Elev.	SWL	Date	Use	Owner	Geohydrologic Unit	Yield
PDWP	103789	860	528	--	104	1984	Municipal	Linn Creek	Ozark Aquifer	70
PDWP	103975	340	100	--	--	1978	Non-community Public	Guido & Frankies	Ozark Aquifer	--
PDWP	103982	--	--	--	--	--	Community Public	Country Meadows Estates	Ozark Aquifer	--
PDWP	104064	1000	425	--	--	1997	Community Public	Seven Trails West Subdivision	Ozark Aquifer	--
PDWP	105033	565	337	--	90	--	Community Public	Camden Co. PWSD #5 - Clearwater Condo	Ozark Aquifer	120
PDWP	105998	--	--	--	--	--	Community Public	Timberlake Terrace	Ozark Aquifer	--
WIMS	4044	425	84	--	185	1987	Domestic	--	Ozark Aquifer	40
WIMS	5142	360	105	--	160	1988	Domestic	--	Ozark Aquifer	35
WIMS	5557	300	126	--	200	1988	Domestic	--	Ozark Aquifer	25
WIMS	7295	380	126	--	270	1988	Domestic	--	Ozark Aquifer	40
WIMS	7296	380	85	--	250	1988	Domestic	--	Ozark Aquifer	20
WIMS	7320	155	105	--	20	1988	Domestic	--	Ozark Aquifer	60
WIMS	8591	322	106	--	25	1988	Domestic	--	Ozark Aquifer	40
WIMS	8592	385	84	--	180	1988	Domestic	--	Ozark Aquifer	30
WIMS	8719	400	181	--	155	1988	Domestic	--	Ozark Aquifer	30
WIMS	11489	400	106	--	160	1988	Domestic	--	Ozark Aquifer	25
WIMS	11697	375	80	--	--	1988	Domestic	--	Ozark Aquifer	18
WIMS	14203	340	168	--	210	1987	Domestic	--	Ozark Aquifer	35
WIMS	16083	251	86	--	--	1989	Domestic	--	Ozark Aquifer	30
WIMS	16654	218	126	--	--	1989	Domestic	--	Ozark Aquifer	25
WIMS	24383	415	80	--	--	2000	Domestic	--	Ozark Aquifer	35
WIMS	24538	380	140	945	208	2005	Domestic	--	Ozark Aquifer	20
WIMS	35888	333	121	--	210	1991	Domestic	--	Ozark Aquifer	20
WIMS	35889	332	80	--	180	1994	Domestic	--	Ozark Aquifer	18
WIMS	43866	400	103	--	207	1990	Domestic	--	Ozark Aquifer	20
WIMS	43978	100	60	--	--	1989	Domestic	--	Ozark Aquifer	25
WIMS	46895	377	119	--	205	1993	Domestic	--	Ozark Aquifer	25
WIMS	52598	312	100	--	155	1992	Domestic	--	Ozark Aquifer	25
WIMS	52601	210	140	--	40	1993	Domestic	--	Ozark Aquifer	50
WIMS	52632	210	120	665	45	1992	Domestic	--	Ozark Aquifer	30
WIMS	54160	500	355	--	230	1990	Domestic	--	Ozark Aquifer	30
WIMS	54161	340	106	--	166	1990	Domestic	--	Ozark Aquifer	22
WIMS	54164	355	170	905	207	1990	Domestic	--	Ozark Aquifer	30
WIMS	54493	282	126	--	35	1990	Domestic	--	Ozark Aquifer	35
WIMS	62718	200	100	--	12	1991	Domestic	--	Ozark Aquifer	60
WIMS	62774	360	144	--	205	1991	Domestic	--	Ozark Aquifer	30
WIMS	64171	170	124	--	30	1991	Domestic	--	Ozark Aquifer	30
WIMS	68406	220	120	679	18	1991	Domestic	--	Ozark Aquifer	8
WIMS	77412	351	80	--	150	1992	Domestic	--	Ozark Aquifer	25
WIMS	77419	360	80	--	210	1992	Domestic	--	Ozark Aquifer	40
WIMS	77420	370	80	--	195	1992	Domestic	--	Ozark Aquifer	20
WIMS	91373	480	105	--	290	1993	Domestic	--	Ozark Aquifer	20
WIMS	91400	360	84	--	225	1993	Domestic	--	Ozark Aquifer	25
WIMS	100968	460	167	--	196	1994	Domestic	--	Ozark Aquifer	15

Water wells located within 4 miles of Dawson Metal Products Facility #2 site.

Source	Well ID	Depth	Casing	Elev.	SWL	Date	Use	Owner	Geohydrologic Unit	Yield
WIMS	120268	200	144	807	80	--	Domestic	--	Ozark Aquifer	30
WIMS	120299	280	--	--	--	1994	Domestic	--	Ozark Aquifer	--
WIMS	120864	375	100	--	270	1994	Domestic	--	Ozark Aquifer	20
WIMS	120865	377	126	--	220	1994	Domestic	--	Ozark Aquifer	20
WIMS	120872	393	100	--	260	1994	Domestic	--	Ozark Aquifer	25
WIMS	120873	170	110	--	25	1994	Domestic	--	Ozark Aquifer	20
WIMS	135731	410	115	925	--	1995	Domestic	--	Ozark Aquifer	30
WIMS	138031	351	100	--	155	1995	Domestic	--	Ozark Aquifer	25
WIMS	138032	333	107	954	165	1995	Domestic	--	Ozark Aquifer	30
WIMS	138045	385	130	816	20	1996	Domestic	--	Ozark Aquifer	25
WIMS	138061	310	80	--	170	1996	Domestic	--	Ozark Aquifer	20
WIMS	138062	333	108	--	--	1995	Domestic	--	Ozark Aquifer	25
WIMS	138063	333	80	--	170	1996	Domestic	--	Ozark Aquifer	30
WIMS	138069	371	105	--	170	1996	Domestic	--	Ozark Aquifer	25
WIMS	138081	310	80	--	145	1996	Domestic	--	Ozark Aquifer	20
WIMS	138809	460	100	984	315	1995	Domestic	--	Ozark Aquifer	25
WIMS	148329	415	100	--	150	1996	Domestic	--	Ozark Aquifer	50
WIMS	148583	320	105	846	175	1995	Domestic	--	Ozark Aquifer	40
WIMS	148588	320	104	--	110	1995	Domestic	--	Ozark Aquifer	40
WIMS	154630	178	100	768	--	1996	Domestic	--	Ozark Aquifer	60
WIMS	157785	150	120	670	7	1996	Domestic	--	Ozark Aquifer	30
WIMS	158056	410	157	1030	220	1997	Domestic	--	Ozark Aquifer	25
WIMS	169782	300	97	--	175	1997	Domestic	--	Ozark Aquifer	30
WIMS	173793	430	142	--	260	1996	Domestic	--	Ozark Aquifer	50
WIMS	181023	340	120	669	12	1997	Domestic	--	Ozark Aquifer	30
WIMS	186130	440	100	984	260	1998	Domestic	--	Ozark Aquifer	30
WIMS	189061	375	80	--	205	1997	Domestic	--	Ozark Aquifer	--
WIMS	189063	353	100	807	185	1997	Domestic	--	Ozark Aquifer	--
WIMS	189065	353	100	--	240	1997	Domestic	--	Ozark Aquifer	--
WIMS	189073	370	110	--	210	1997	Domestic	--	Ozark Aquifer	20
WIMS	189075	210	110	660	20	1997	Domestic	--	Ozark Aquifer	--
WIMS	189088	350	80	945	--	1997	Domestic	--	Ozark Aquifer	25
WIMS	189097	170	100	--	30	1997	Domestic	--	Ozark Aquifer	20
WIMS	190858	280	102	846	140	1998	Domestic	--	Ozark Aquifer	20
WIMS	198718	360	250	--	175	1998	Domestic	--	Ozark Aquifer	15
WIMS	208682	427	100	--	350	1998	Domestic	--	Ozark Aquifer	15
WIMS	209918	460	80	--	230	1999	Domestic	--	Ozark Aquifer	35
WIMS	209943	380	100	--	200	1999	Domestic	--	Ozark Aquifer	25
WIMS	210501	180	120	685	30	1998	Domestic	--	Ozark Aquifer	40
WIMS	214483	375	100	--	205	1999	Domestic	--	Ozark Aquifer	30
WIMS	217588	170	105	660	30	1997	Domestic	--	Ozark Aquifer	25
WIMS	217600	190	84	--	30	1998	Domestic	--	Ozark Aquifer	25
WIMS	217602	190	80	--	25	1998	Domestic	--	Ozark Aquifer	25
WIMS	217613	395	103	--	265	1998	Domestic	--	Ozark Aquifer	20

Water wells located within 4 miles of Dawson Metal Products Facility #2 site.

Source	Well ID	Depth	Casing	Elev.	SWL	Date	Use	Owner	Geohydrologic Unit	Yield
WIMS	221967	340	100	1000	210	2000	Domestic	--	Ozark Aquifer	35
WIMS	226701	420	100	--	200	2000	Domestic	--	Ozark Aquifer	45
WIMS	226703	200	120	649	12	2000	Domestic	--	Ozark Aquifer	30
WIMS	226704	380	100	--	180	2000	Domestic	--	Ozark Aquifer	50
WIMS	226713	300	100	--	90	1999	Domestic	--	Ozark Aquifer	50
WIMS	226740	380	80	--	--	2002	Domestic	--	Ozark Aquifer	30
WIMS	226768	440	100	990	290	1999	Domestic	--	Ozark Aquifer	30
WIMS	228440	215	117	689	10	2000	Domestic	--	Ozark Aquifer	25
WIMS	228688	200	120	690	22	1999	Domestic	--	Ozark Aquifer	25
WIMS	228722	300	120	930	180	1999	Domestic	--	Ozark Aquifer	40
WIMS	236450	370	100	--	220	1998	Domestic	--	Ozark Aquifer	25
WIMS	237676	240	120	689	18	2000	Domestic	--	Ozark Aquifer	40
WIMS	247527	405	--	--	250	2006	Domestic	--	Ozark Aquifer	--
WIMS	247650	--	--	--	200	2010	Domestic	--	Ozark Aquifer	--
WIMS	251146	440	140	1080	--	2000	Domestic	--	Ozark Aquifer	25
WIMS	252744	400	80	960	248	2000	Domestic	--	Ozark Aquifer	30
WIMS	252907	380	140	964	252	2001	Domestic	--	Ozark Aquifer	40
WIMS	255051	450	100	--	220	2000	Domestic	--	Ozark Aquifer	40
WIMS	255063	400	100	--	200	2000	Domestic	--	Ozark Aquifer	35
WIMS	256055	350	80	--	220	2001	Domestic	--	Ozark Aquifer	20
WIMS	256365	190	80	--	20	2000	Domestic	--	Ozark Aquifer	30
WIMS	263081	370	92	--	230	2001	Domestic	--	Ozark Aquifer	25
WIMS	263087	375	80	--	145	2000	Domestic	--	Ozark Aquifer	18
WIMS	263102	497	100	--	340	2001	Domestic	--	Ozark Aquifer	25
WIMS	263110	370	80	--	188	2002	Domestic	--	Ozark Aquifer	25
WIMS	271430	340	80	--	130	2001	Domestic	--	Ozark Aquifer	26
WIMS	274486	180	100	787	6	2002	Domestic	--	Ozark Aquifer	30
WIMS	274511	400	140	925	248	2001	Domestic	--	Ozark Aquifer	30
WIMS	278442	350	90	--	195	2002	Domestic	--	Ozark Aquifer	25
WIMS	278458	370	110	--	200	2002	Domestic	--	Ozark Aquifer	20
WIMS	293094	400	120	860	270	2002	Domestic	--	Ozark Aquifer	30
WIMS	294601	425	122	925	260	2002	Domestic	--	Ozark Aquifer	49
WIMS	309062	420	100	--	181	2003	Domestic	--	Ozark Aquifer	35
WIMS	309093	240	80	689	28	2002	Domestic	--	Ozark Aquifer	40
WIMS	310109	340	160	920	172	2005	Domestic	--	Ozark Aquifer	30
WIMS	319713	400	120	--	200	2003	Domestic	--	Ozark Aquifer	--
WIMS	321163	370	110	--	165	2003	Domestic	--	Ozark Aquifer	20
WIMS	321165	310	100	--	109	2003	Domestic	--	Ozark Aquifer	25
WIMS	321252	500	100	--	328	2004	Domestic	--	Ozark Aquifer	35
WIMS	321693	460	160	1060	252	2003	Domestic	--	Ozark Aquifer	30
WIMS	322919	375	100	--	200	2003	Domestic	--	Ozark Aquifer	35
WIMS	327008	440	120	--	198	2004	Domestic	--	Ozark Aquifer	30
WIMS	332766	560	140	1023	294	2005	Domestic	--	Ozark Aquifer	15
WIMS	334804	305	--	--	--	2005	Domestic	--	Ozark Aquifer	--

Water wells located within 4 miles of Dawson Metal Products Facility #2 site.

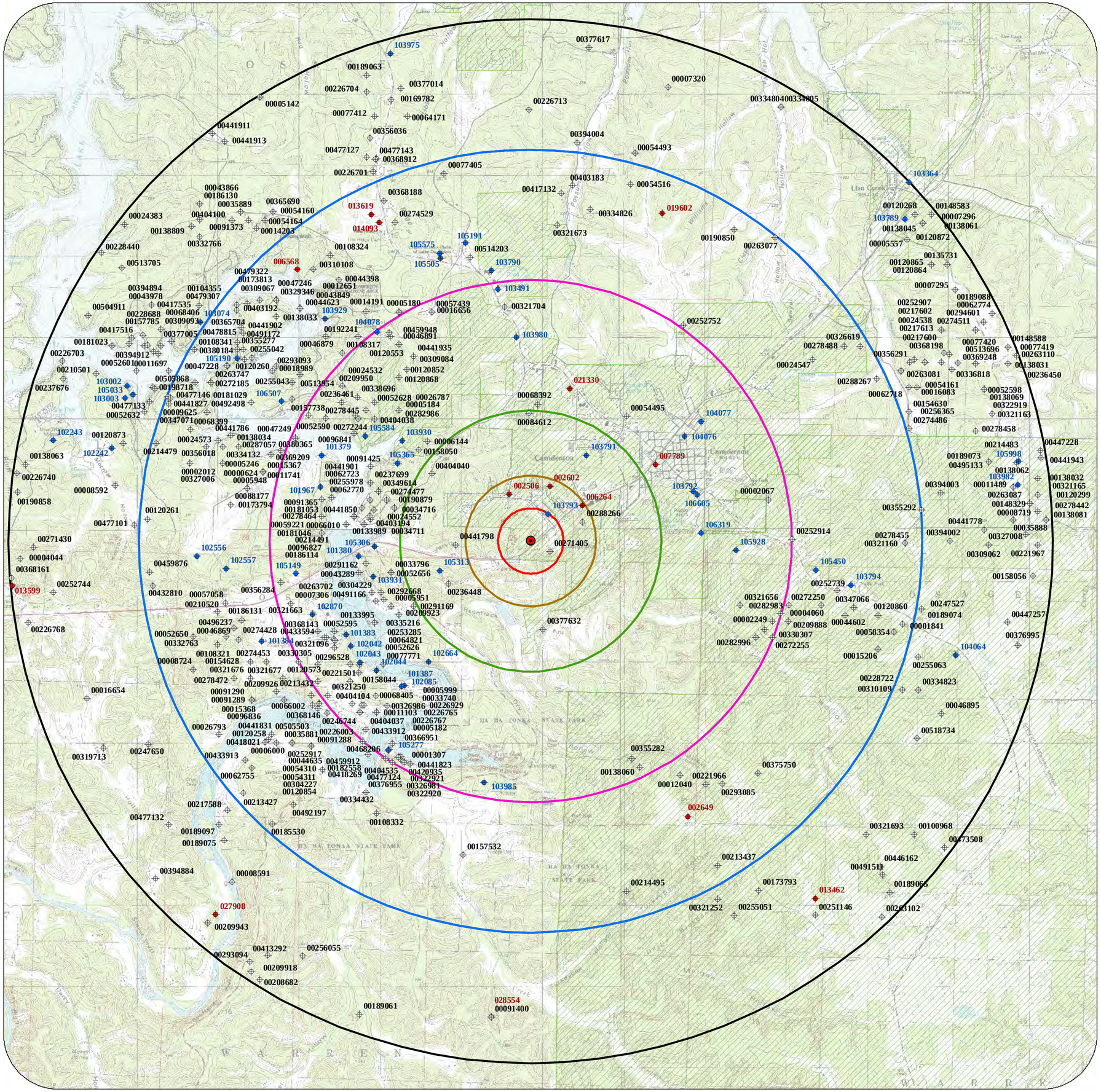
Source	Well ID	Depth	Casing	Elev.	SWL	Date	Use	Owner	Geohydrologic Unit	Yield
WIMS	334805	205	--	--	--	2005	Domestic	--	Ozark Aquifer	--
WIMS	334823	305	81	920	160	2005	Domestic	--	Ozark Aquifer	25
WIMS	336818	400	80	--	231	2004	Domestic	--	Ozark Aquifer	35
WIMS	355292	420	80	--	160	2005	Domestic	--	Ozark Aquifer	65
WIMS	356036	325	81	--	17	2005	Domestic	--	Ozark Aquifer	30
WIMS	356291	360	160	--	238	2005	Domestic	--	Ozark Aquifer	30
WIMS	365690	500	80	--	265	2005	Domestic	--	Ozark Aquifer	25
WIMS	368161	440	160	--	170	2006	Domestic	--	Ozark Aquifer	30
WIMS	368198	380	160	--	190	2006	Domestic	--	Ozark Aquifer	20
WIMS	368912	420	80	--	270	2006	Domestic	--	Ozark Aquifer	25
WIMS	369248	467	161	--	245	2006	Domestic	--	Ozark Aquifer	30
WIMS	376995	405	81	--	260	2006	Domestic	--	Ozark Aquifer	45
WIMS	377005	265	105	--	15	2006	Domestic	--	Ozark Aquifer	35
WIMS	377014	385	81	--	180	2006	Domestic	--	Ozark Aquifer	35
WIMS	377617	245	81	--	80	2006	Domestic	--	Ozark Aquifer	30
WIMS	394002	390	100	--	188	2006	Domestic	--	Ozark Aquifer	60
WIMS	394003	270	80	--	100	2006	Domestic	--	Ozark Aquifer	40
WIMS	394004	190	80	--	20	2006	Domestic	--	Ozark Aquifer	35
WIMS	394884	400	80	--	260	2006	Domestic	--	Ozark Aquifer	25
WIMS	394894	230	120	--	30	2007	Domestic	--	Ozark Aquifer	35
WIMS	394912	220	120	--	10	2007	Domestic	--	Ozark Aquifer	30
WIMS	404100	520	120	--	292	2008	Domestic	--	Ozark Aquifer	12
WIMS	413292	520	115	--	200	2007	Domestic	--	Ozark Aquifer	20
WIMS	417516	230	120	--	15	2007	Domestic	--	Ozark Aquifer	30
WIMS	417535	250	120	--	20	2007	Domestic	--	Ozark Aquifer	35
WIMS	441778	365	122	--	180	2009	Domestic	--	Ozark Aquifer	30
WIMS	441911	405	82	--	240	2010	Domestic	--	Ozark Aquifer	25
WIMS	441913	385	82	--	240	2010	Domestic	--	Ozark Aquifer	30
WIMS	441943	365	83	--	160	2010	Domestic	--	Ozark Aquifer	30
WIMS	446162	580	115	--	200	2010	Domestic	--	Ozark Aquifer	35
WIMS	447228	405	105	--	160	2011	Domestic	--	Ozark Aquifer	50
WIMS	447257	465	103	--	218	2010	Domestic	--	Ozark Aquifer	20
WIMS	473508	520	200	--	312	2012	Domestic	--	Ozark Aquifer	40
WIMS	477101	230	95	--	40	2012	Domestic	--	Ozark Aquifer	25
WIMS	477127	405	95	--	150	2013	Domestic	--	Ozark Aquifer	30
WIMS	477132	400	75	--	180	2014	Domestic	--	Ozark Aquifer	25
WIMS	477133	230	135	--	20	2014	Domestic	--	Ozark Aquifer	30
WIMS	477143	440	95	--	160	2014	Domestic	--	Ozark Aquifer	35
WIMS	478815	250	100	--	90	2013	Domestic	--	Ozark Aquifer	20
WIMS	479307	420	280	--	190	2013	Domestic	--	Ozark Aquifer	30
WIMS	491511	575	95	--	260	2014	Domestic	--	Ozark Aquifer	35
WIMS	495133	420	100	--	200	2015	Domestic	--	Ozark Aquifer	30
WIMS	504911	260	120	--	22	2015	Domestic	--	Ozark Aquifer	40
WIMS	505868	255	115	--	30	2016	Domestic	--	Ozark Aquifer	40

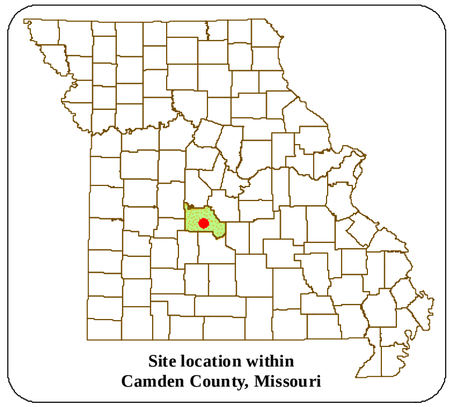
Water wells located within 4 miles of Dawson Metal Products Facility #2 site.

Source	Well ID	Depth	Casing	Elev.	SWL	Date	Use	Owner	Geohydrologic Unit	Yield
WIMS	513696	465	83	--	180	2016	Domestic	--	Ozark Aquifer	30
WIMS	513705	475	163	--	30	2016	Domestic	--	Ozark Aquifer	120
WIMS	518734	420	180	--	270	2016	Domestic	--	Ozark Aquifer	30
Logmain	13462	275	--	1065	225	1955	Domestic	Chandler	Ozark Aquifer	--
Logmain	13599	212	--	989	52	1955	Domestic	Dillenberger	Ozark Aquifer	--
Logmain	27908	300	--	--	120	1975	Domestic	Stewart	Ozark Aquifer	--
Logmain	28554	447	--	824	260	1978	Domestic	Darmpier	Ozark Aquifer	--

Wells found within 3 to 4 miles of the site: 189

Figure 2:
Four-Mile Well Survey
Dawson Metal Products Facility #2 Site
Camden County, Missouri
September 12, 2017





Revision: March 14, 2018 – See Footnote #1

CITCAT Group Meeting Notes
December 12, 2017, 5-7pm
Mid-County Fire Station, Camdenton MO

Group members present were Don Barrett, Dale Bland, Jessica Bockoven, Bryant Burton, Leslie Chamberlin, Larry Coleman, Steve Eden, Danielle Farson, James Gohagan, Greg Hasty, Pam Holley, Jannea Hazama, Shawn Kober, Jerry Rogers, Scott Martin, and Jack Quade.

Agenda (*attached*)

Overview Presentation

Jennifer Lamons, MDNR, opened the Meeting with a presentation overview of CITCAT general procedures and roles. She indicated that the presentation slides will be emailed to the Group. She also referred Group Members to the attachment in our package regarding 'Robert's Rules of Order', a guideline for conducting these type meetings with example dialogue *(attached)*.

The presentation included the Mission Statement determined by the Core Group members. Member question/discussion on the scope or definition of "misuse" in the Statement was had. The Group indicated that "misuse" will, for the purposes of this Group, include both historical processes (that may not have been known, at that time, to be 'misuse' as we think of it today) and the use that was known to be 'misuse' at the time.

Next order of business, during the presentation, was to elect a Chairperson ("Chair") for the Group. Multiple suggestions and affirmatives, and ultimately a majority vote, that James Gohagan be elected Chair. Mr. Gohagan accepted. The Chair's role will be one of leading the meetings, keeping order and courtesy, and promoting the forward movement of the meetings.

Previous to the 5-7 pm meeting, the Core Group had met from 4-5 pm and selected Don Barrett to be Secretary for the Group. The Secretary's role will be to keep notes and written questions from the Meeting and email those notes/questions to MDNR (Jennifer Lamons) within 48 hours of the Meeting.

The Core Group also selected Jerry Rogers to be the Facebook Communicator. His role will be to submit the official notices from the Group to the public Facebook page (*Camdenton County Contamination Board* at https://www.facebook.com/groups/249911762009559/about/).

The Core Group also selected Jannea Hazama to manage the sign-in table for Meetings.

The presentation touched on terms of Roles, such as for the Chair, which serves for one year. Other Group roles or members have no limits of terms. Members in Roles can be voted to be changed with a majority vote of the Group. If a member drops out (other than the Chair), the Core Group has decided, at this time, to leave the position vacant.

Comments and Questions During the Meeting

Following the presentation, Introductions of those at the Group Table were held. Highlights of discussions during and following the Introductions included:

- Larry Coleman stated that more than 2,300 cubic yards of material was dumped at the Airport and TCE was getting into his and Scott Martin's private wells. Mr. Coleman and Mr. Martin indicated that the MDNR sampling of their wells, located near the Airport, showed detected TCE where none had been detected in previous sampling.
- The Group discussed obtaining previous reports and files that the MDNR has at its offices. Mr. Jurgensmeyer, MDNR Hazardous Waste Program Director, indicated that there are reports in paper form on shelves at MDNR. The issue, as with a number of agencies, is getting these older reports digitized. Mr. Jurgensmeyer indicated that reports can be made available to the public with the exception of those involved in legal cases. Group members indicated familiarity with the Sunshine laws and obtaining documents from agencies and this may be a path to be pursued going forward (due to limited time at this Meeting, the purpose of which was to go over the basics for the Group, it was suggested that this idea and subsequent others be briefly discussed but, if needed, be "tabled", meaning to discuss at the end of the Meeting, if time allowed, or at future Meetings).
- Mr. Coleman indicated he was recently at the Modine facility and saw a 3-4 year-old child playing in a ditch at the facility; he observed no signs indicating that the public should not access the facility. The postage of signs at the facility was discussed as an Immediate Need. Suggestion was put forth by Greg Hasty for the Group to compile a list of Immediate Needs that it could recommend to MDNR (suggestion was acknowledged and tabled).
- Discussion on the size and ownership of the lot purchased by Mr. Dawson (historic owner of the facility) was had. Suggestion was to check with the City/County and obtain the information. Leslie Chamberlin and Greg Hasty indicated that they had knowledge of this process and could assist on this.
- Discussion of discharge from the Lagoon was had. Several Group members expressed interest in having the discharge sampled.
- Discussion of the requirements for public notice of Meetings was had as well as the Group being able to post/produce/input into ads with radio, comments, calendar, and newsletter. Two Members indicated that ads in the newspaper and other media can be expensive – MDNR noted that the one-time ad for this Meeting in the newspaper was thought to cost $109, as an example. Group Members indicated it is unclear on what funds are available to the Group and MDNR stated that they would seek information on this for the Group. Ideas regarding free mechanisms to get information out to the public were discussed including free live broadcasting of the Meetings on Facebook. Shawn Kober expressed his knowledge on this subject and volunteered to assist with this effort.

- Jack Quade indicated that his family's previous plan to relocate to the Jeff City area was on hold due to the inability to sell his home due to the public knowledge and/or disclosure of contamination in the area. Other Members expressed concern over property values.
- Steve Eden was asked about his family and he let the Group know that his wife and daughter had passed away some time ago. Although he stated that he could not say it was from the contamination issues the Group was addressing, regardless, he expressed commitment to help the Group as much as he can and to resolve the issue for the community, not just for himself. Subsequent comments about too many people in the area being sick or dying was expressed by some Members.
- Jerry Rogers indicated that he worked at the facility from 1972 to 2012. He said he was present at the facility the night of the fire and was familiar with the Cox Building site. He indicated he has been to too many funerals and wants to help stop that.
- Scott Martin indicated that it was his sister that reported dumping to MDNR in the 1980s. Mr. Coleman, with Mr. Martin's permission, shared with the Group, a notice of a communication *(attached)* from Ms. Kay Dempsey in August 1986 to David Ramsey of the USEPA in Jefferson City, alleging the plant was discharging metals to a ravine which led to a lake near Normac Estates.
- Brief discussions were held by some Group Members regarding their knowledge of dumping of materials associated with historic operations. Dale Bland indicated that ~~*he was aware of dust generated by operations and stated that*~~[1] when it rained, there would be a sweet, sticky taste to the air. Jerry Rogers indicated that, while working at the facility, during excavations, they could dig a hole and TCE ("or oil", as added by a Member) would seep into the hole.
- Jannea Hazama indicated that her house was one of two houses impacted. She stated that she would like her soil and water tested. She indicated her concerns for herself and her neighborhood.
- Greg Hasty expressed concern of the safety of the current City drinking water supply and suggested independent testing be a recommendation of the Group. Mr. Coleman indicated that he had requested that the Blair well would be sampled; it was unknown if this was conducted.
- Mr. Coleman indicated that he and another City personnel did the City water sampling one time and all the tests came back "bad" except for one sample, which was the Rodeo well. He stated that he did not know what was "bad" in the sample. He also stated that he knew on two occasions that the Mulberry well was used as the Blair well was broke down and he was working on the Rodeo well, so he stated that the Mulberry well was pumping.
- Group discussed that future meetings are to be held monthly; frequency may be increased if needed.

[1] In the March 13, 2018, meeting, Mr. Bland requested that these Minutes be corrected to clarify that he did not mention dust at the facility but had indicated that he was aware of <u>exhaust fumes</u> generated by the degreasing operations at the facility.

- Water testing was further discussed including where to sample (well or tap); questions on possible funding mechanisms (MDNR indicated that Responsible Parties and MDNR may be a source of funding for CITCAT recommendations/requests); costs of samples (some Members indicated their understanding of the pricing of sampling varies); and whether to include lead or not. Lead's natural prevalence in Missouri was discussed by Bryant Burton and Pam Holley.
- The issue of the naming of "Hulett Lagoon" was discussed. Group Members expressed it was unfair to "label" the lagoon after the Hulett family and could be detrimental to their business. The naming of the Lagoon after Hulett was stated by a Group Member to be because the Lagoon was located behind the Hulett property and the community used the name for ease of giving directions to the Lagoon. MDNR indicated that a petition to the City may be needed to change the name. Mr. Martin indicated that the Group should also discuss an upcoming $5 Million grant to the City for an expansion project.
- Mr. Coleman requested a copy of a picture from MDNR showing the Lagoon before it was closed (pre-1987). He stated that he had seen one in a previous training in Jeff City. MDNR indicated they would look for a picture.
- Members discussed the remediation (excavation) of the Lagoon historically.
- Greg Hasty made a Motion to recommend that independent tests of the City water supply be conducted. Pam Holley asked what would satisfy as "independent" testers; Would MDNR sampling be acceptable? Mr. Hasty indicated that anyone but the City would be acceptable. The Motion was seconded and passed by Group majority vote.
- Shawn Kober suggested that the water at the School be tested as a priority.

Time ran out for the Meeting. The next meeting is to be held on January 9, 2018; anticipated to be at the same location – Mid-County Fire Department.

Meeting was concluded by the Chair.

Attachments:
A. Agenda
B. Robert's Rules of Order Handout
C. 1986 Notice of Communication

These notes were compiled by Pam Holley, at the request of the Chair and the Secretary. The Chair and Secretary will review and the Notes will be forwarded to Jennifer Lamons at MDNR for posting. Written questions were obtained by Ms. Lamons at the Meeting.

Attachment A. Meeting Agenda

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Notice of Open Meeting
Camdenton Industrial TCE Contamination
Advisory Team Meeting

People requiring special services at the meeting can make arrangements by calling 800-361-4827 or 573-751-3176. Hearing and speech impaired individuals may contact the department through Relay Missouri, 800-735-2966.

AGENDA

Mid-County Fire Protection District
Camdenton Fire Department
184 North Business Route 5
Camdenton

December 12, 2017

5 to 7 p.m.

1. Call Meeting to Order	CITCAT Core Member
2. Introductions	CITCAT Core Team
3. Old Business	CITCAT Core Team
A. Discuss CITCAT Meeting Procedures	
B. Vote on Mission Statement	
C. Vote on Chairperson and Secretary	
D. Missouri Sunshine Law	
E. Roberts Rules of Order	
4. New Business	CITCAT Chairperson
A. New Member Introductions	
B. Topics for Future Meetings	
5. Announce Next Meeting	CITCAT Chairperson
6. Adjourn	CITCAT Chairperson

If you have any questions regarding this meeting, please contact:

Hazardous Waste Program, PO Box 176, Jefferson City, MO 65102-0176
Phone: 573-751-3176; Email: jennifer.lamons@dnr.mo.gov

Attachment B. Robert's Rules

Roberts Rules of Order

Presiding officers need to plan ahead. With an agenda and knowledge of the business at hand *before* the meeting, a plan (such as the one below) can help a presiding officer stay organized and keep the meeting orderly and on task. The chairperson should fill out a meeting plan with items specific to each meeting to use as a "script" for conducting meetings.

Remember…

- ✓ Voting is by majority vote.
- ✓ Only one person speaks at a time, while others listen politely and wait their turn to speak.
- ✓ Decorum is to be maintained at all times, the Chairperson is in charge of maintaining order. Members should respect the rules of the advisory team and one another.

- **Call to Order** (Chair)
- **Approval or correction of minutes** (Secretary)
  - *"A copy of last month's minutes was emailed to you _____. Please let me know if you found any errors."* (Pause here to let people think.)
  - *Are there any corrections to the minutes?*
  - Take corrections until there are no more.
  - If there are no corrections, say, "*The minutes stand as approved*." If there are corrections, take a vote to allow the changes or to let the minutes stand. Secretary notes any approved changes and sends members revised copy of minutes from last meeting.
- **Old Business** (Chair)*
  - Review old business, take care of unfinished business -- take votes if needed, chairperson announces the result.
- **New Business** (Chair)
  - Chair asks, *"Is there new business?"*
  - Member rises and addresses the chair. "*Mr./Madam Chairman.*"
  - Chair recognizes the member. "*The chair recognizes Ms. Smith*." Comments are heard, questions are asked, votes are taken, debates occur always with the chairperson maintaining order and decorum. The person with the floor should not be interrupted by others in the room, if they are, the chairperson reminds everyone that they may have a turn to comment when the person is finished talking. If it is a debate, the chairperson may allow comments from anyone as long as members take turns.
  - If the member speaking wants to make a motion, they should say, *(for example), "I move to invite site technical staff to present on _____ at the March meeting."*
  - Another member seconds the motion by saying, *"Second."*
  - The chair states the motion. "*It is moved and seconded to invite site technical staff to present on _____ at the March meeting. Are you ready for the question?"*
  - The members debate the motion in an orderly fashion, with the chair presiding. The chair should say, "*The chair recognizes Mr. Jones to speak to the motion."* And so-on, until the debate is heard.
  - The chair puts the question before the advisory team and the members vote. *"Those in favor of inviting site technical staff to present on _____ at the March meeting, raise your hand." "Those not in favor?"* Majority vote.

Attachment B. Robert's Rules

- The chair announces the result of the vote. *"In Favor has it, and the motion carries. We will invite site technical staff to present on _____ at the March meeting."* This is also a good time for the group to decide who is going to be in charge of contacting the site technical staff and arranging for them to come to the March meeting.
- Updates by project technical staff and topic presentations by agency staff, potential responsible parties, other speakers CITCAT members want to invite to meetings.
- Questions and comments from the public are taken during this part of the meeting; chair presides over the exchange of questions and answers and maintains order during this time. The secretary should record all questions and comments and submit them to MoDNR in writing (email to Jennifer Lamons at jennifer.lamons@dnr.mo.gov).

- **Announcements** (Chair)
  - Announce the date, time and location of the next meeting. *"We need to set the date for the next meeting. It looks like the second Tuesday of next month is the usual date. Shall we meet next at 5 p.m. on January 9? Hearing no objection, we'll meet next on January 9 here at the fire station."*
- **Adjourn** (Chair)
  - *"There being no further business to come before the advisory team, the meeting is adjourned."*

Other Procedural Items

- *To change operating procedures, core group votes – majority vote. Chairperson does not vote, unless there is a tie.*
- Only the core votes on administrative items.
- Members and core members vote on everything else.
- Jennifer will send public notice of meeting to chairperson to post on the front door of meeting place. She will receive meeting minutes from secretary, review and send to Amy Poos to post on the site's webpage. Jennifer will receive questions from the secretary and disseminate to the appropriate authority. She will also create public notices for meetings and send to Amy to post on the department's webpage, make copies needed for CITCAT meetings and arrange meeting locations for CITCAT meetings.

*Old Business is (in this order):

- Any item that was pending when the previous meeting adjourned.
- Business items that were on the "old business" list in the previous meeting but were still not taken up before adjourning.
- Any item that was purposefully postponed to the following meeting.

To learn more about Robert's Rules of Order, visit the following webpages:
robertsrules.org/
rulesonline.com/rror-01.htm
afsc.noaa.gov/education/activities/PDFs/SBSS_Lesson6_roberts_rules_of_order.pdf
parlipro.org/

Attachment C. 1986 Notice of Communication

8-4-86
8-11-86
8-11-86

#

DEPARTMENT OF NATURAL RESOURCES
Division of Environmental Quality

MEMORANDUM TO THE FILE

File NPC - 3023-87

Date 8/4/86

Field ( )
Telephone ~~X~~

FACILITY Sunstrand Tubular Products, Camdenton, allegedly dumping waste metals into the lake from a plant discharge

PERSONS INVOLVED

Name	Representing
David Ramsey	U.S. EPA, Jefferson City

SUMMARY OF CONVERSATION Mr. Ramsey got a call from Kay Dempsey, I & U Real Estate, 54 West Camdenton, ph # 346-4869 alleging that Sunstrand Tubular Products has a discharge pipe that drains to a ravine, then into a small creek, and into the lake near Normac Estates. The discharging activity allegedly is predominately on weekends.

Mr. Dick Craig is also familar with the problem - he lives in Normac Ests. - He's a postal employee in Springfield & is hard to get in touch with. ph # 346-3851.

~~ACTION TAKEN~~ Some one should call Ms. Dempsey & let her know it will be investigated.

found no evidence of illegal discharge

Signature

FILE: Camdenton Sludge Disposal Area PA/SI Site
CamdenCounty

MEMORANDUM

DATE: March 30, 1999

TO: Valerie Wilder, Environmental Specialist
Superfund Section, HWP, DEQ

FROM: Neil Elfrink, Geologist
Environmental Geology Section, GSP, DGLS

SUBJECT: Hydrogeologic Report for the Camdenton Sludge Disposal Area Site

LOCATION: NW 1/4, SE 1/4, SE 1/4, Section 4, T. 37 N., R. 16 W., Camden County, Missouri; 37° 58' 10" North Latitude and 92° 41' 20" West Longitude

The hydrogeologic report for the Camdenton Sludge Disposal Area site is enclosed. Please contact me at (573) 368-2162 if you have any questions regarding this report, or if additional information is required.

NE/lh

Attachments

HYDROGEOLOGIC REPORT FOR THE CAMDENTON SLUDGE DISPOSAL AREA CAMDENTON, CAMDEN COUNTY, MISSOURI

GENERAL CONSIDERATIONS

Site Location

The Camdenton Sludge Disposal Area is located on the Decaturville 7.5-minute quadrangle map (Figure 1), in the Northwest Quarter (NW 1/4) of the Southeast Quarter (SE 1/4) of the Southeast Quarter (SE 1/4) of Section 4, Township 37 North, Range 16 West. Coordinates for the center of the disposal area are approximately 37º 58' 10" north latitude and 92º 41' 20" west longitude. Elevation at the site is approximately 1,060 feet MSL. The Camdenton Sludge Disposal Area is located at the Camdenton Memorial Airport, south of the runway and north of County Road 5-120. The site is approximately 4.6 miles southeast the Former Hulett Lagoon Site. Contaminated soils from the Former Hulett Lagoon in Camdenton were transported to and disposed of at the Camdenton Sludge Disposal Area in 1988.

Physiographic Province

The site is situated on an upland in the Salem Plateau region of the Ozark Plateau physiographic province (Missouri Water Atlas, 1986). The topography of the Salem Plateau is characterized by a rolling upland surface with rugged hills dissected by entrenched, narrow stream valleys (Gann, 1976). Karst features, such as springs, sinkholes, and losing streams, are characteristic of the Salem Plateau.

GROUNDWATER PATHWAY

Stratigraphic Units

A stratigraphic column (Table 1) has been tabulated based upon the stratigraphy of nearby wells (Well Log File, 1999). The Camdenton Sludge Disposal Area has been included on a geologic map produced by Mark Middendorf (1984).

The youngest bedrock formation beneath the site is the Ordovician-age Roubidoux Formation, assigned to the Canadian Series. The Roubidoux Formation consists of dolomite, sandy dolomite, and sandstone (Thompson, 1991). In the Camdenton area, soluble portions of the Roubidoux have generally been removed by dissolution. Nearby well logs indicate that the Roubidoux Formation may consist of clayey residuum and sandstone, with only small lenses of carbonate rock remaining. In the headwaters of Racetrack Hollow, approximately ½ mile west of the site, erosion has completely removed the Roubidoux Formation and the underlying Gasconade Dolomite is exposed at the surface. Approximately 1½ miles northeast of the site, Jefferson City Dolomite exposures overlie the Roubidoux Formation (Middendorf, 1984).

Underlying the Roubidoux Formation, the Gasconade Dolomite consists of cherty

dolomite and is estimated to be approximately 280 feet thick in the vicinity of the site (Well Logs, 1999). A basal unit of the Gasconade Dolomite, known as the Gunter Sandstone Member, commonly separates the Ordovician- and Cambrian-age strata. The Gunter Sandstone is approximately 25 feet thick in the Camdenton Airport area.

Cambrian rocks in the Camdenton area were deposited in a complex depositional environment. The Camdenton Sludge Disposal Area is located near the western margin of a Cambrian-age intrashelf sedimentary basin known as the Central Missouri Basin (Palmer and Hayes, 1997). During Cambrian time, the Camdenton area was part of an emerging tectonic feature known as the Lebanon Arch. The north-south trending Lebanon Arch consists of carbonate platform rocks, that in some areas, thin over Precambrian highlands (Gregg et. al., 1989). The boundary between the Central Missouri Basin and the Lebanon Arch is transitional and poorly defined (Map E, Palmer and Hayes, 1997). Dramatically different lithologies and abrupt facies changes are depicted in area well logs (Figure 2). In general, more shaly, basinal rocks to the east pinch-out against the Lebanon Arch.

Because of the tectonic setting, Cambrian beds in the Camdenton area are difficult to categorize, and “layer-cake” stratigraphy should not be assumed. The following descriptions are simplified. The upper-most Cambrian unit in the area is the Eminence Dolomite, which consists of approximately 240 – 635 feet of dolomite with minor amounts of chert. The Eminence Dolomite is underlain by about 25 - 230 feet of Potosi Dolomite, which consists of dolomite, chert, and drusy quartz. Beneath the Potosi Dolomite, in descending order, are the Derby-Doerun Dolomite, the shaly Davis Formation, the Bonneterre Formation, and the Lamotte Sandstone. The entire Cambrian section is estimated to be over 1,150 feet thick.

Cross-sections constructed using information from specific well logs (Well Log Files, 1999) are presented in Figures 2 and 3. The cross-section locations are shown on Figures 1.

Aquifers

The Ozark Aquifer, which includes all bedrock units above the Cambrian-age Derby-Doerun Dolomite, is the shallowest aquifer beneath site. The Ozark Aquifer is considered exposed at the surface at the Camdenton Sludge Disposal Area. The total thickness of the aquifer is approximately 950 feet. Each of the units which comprise the Ozark Aquifer have individual characteristics that control their water-bearing capabilities; however, in general, the Ozark Aquifer produces good-quality water, with production rates generally proportional to well depth.

According to Harvey et. al. (1983, p. 38), there can be perhaps as many as three separate potentiometric surfaces within in the Ozark Aquifer in upland areas such as the Camdenton Sludge Disposal Area. Water levels in upland wells completed in the Roubidoux Formation range from 18 to 205 feet below the surface. Howver it is possible that the Roubidoux Formation present beneath this particular site is too thin to

contain groundwater. According to Harvey et. al. (1983), water levels in upland wells completed in the Gasconade Dolomite range from 14 to 300 feet below the surface, with an average depth to water of 150 feet. Water levels in upland wells completed in the Eminence Dolomite and deeper formations range from 15 to 407 feet below the surface, with an average depth to water of 200 feet. The multiple water-level phenomenon common in upland areas suggests significant local recharge to the deeper portions of the Ozark Aquifer.

Differences in head between shallow and deep portions of the Ozark Aquifer are typical in upland areas such as the Camdenton Sludge Disposal Area. The site is expected to be a groundwater recharge zone. Extensive pumping of deeper groundwater can increase the downward vertical gradient. The Camdenton Airport Well is reportedly used only once per week with the bulk of water being supplied by Well #2 located approximately 3 miles south of the Camdenton Sludge Disposal Area. Nearby domestic wells can also contribute to an increase in downward gradient. Pumping rates at the Camdenton Airport Well may be high enough to engulf the site within a cone of depression. The radius of influence of nearby production wells should be determined.

Because detailed hydrogeologic studies have not been conducted at the site, groundwater flow directions within the bedrock can only be approximated. According to the potentiometric map of the Roubidoux-Gasconade sequence in “Hydrology of Carbonate Terrane – Niangua, Osage Fork, and Grandglaize Basins, Missouri” (Harvey, et. al., 1983, Figure 13), shallow groundwater beneath the site could flow eastward toward Dry Auglaize Creek. However, according to Figure 15 “Generalized direction of groundwater flow in the Niangua, Osage Fork, and Grandglaize basins” published in the Water Resources Guide No. 35 (Harvey, et. al., 1983), groundwater beneath the site could flow northwestward toward the Niangua Arm of the Lake of the Ozarks. Furthermore, dye traces have shown that surface water lost in Dry Auglaize Creek can cross the surface water divide and discharge into the Niangua River, northwest of the site. It is possible that both groundwater flow directions are correct. Shallow groundwater may flow toward Dry Auglaize Creek, while deeper groundwater may be diverted into the Niangua Basin.

Monitoring well nests are needed to accurately determine the magnitude of the downward vertical gradient. The upper Gasconade Dolomite *may* inhibit the downward migration of contamination. However, fracturing and karst development may have resulted in a local increase in permeability within the otherwise relatively tight upper Gasconade Dolomite.

The Gunter Sandstone is generally highly porous and permeable and is an important source of domestic groundwater supplies in the area. Because the Gunter Sandstone generally yields adequate domestic water supplies, few private wells in the area penetrate the underlying Cambrian Formations. However, municipal wells in the Lake of the Ozarks area are generally cased through the Gunter Sandstone, in order to avoid possible bacterial contamination.

The Eminence and Potosi Dolomites are a major source of municipal drinking water throughout the Ozark area, including the City of Camdenton. The Eminence Dolomite is differentiated from the underlying Potosi Dolomite by the lack of druse. A druse is a rock cavity encrusted with finely crystalline quartz. The druse-rich Potosi Dolomite is the most permeable geologic unit within the Ozark Aquifer and generally has an extensive network of karstic channels.

The shallowest reliable aquitard beneath the site is the St. Francois Confining Unit, approximately 1,150 feet below the surface. The St. Francois Confining Unit separates the Ozark Aquifer from the deeper St. Francois Aquifer. The St. Francois Aquifer includes the Cambrian-age Bonneterre Formation and Lamotte Sandstone. The St. Francois Aquifer is not used as a water source in Camden County. Water losses in the Lamotte Sandstone are common in some parts of the Ozark Region, although the phenomenon is poorly understood. Outside the St. Francois Mountain area, few water wells penetrate the Lamotte Sandstone, since yields may actually be reduced. Groundwater flow directions in the deeper St. Francois Aquifer are generally unknown and may be complicated.

Baseline water-level and pumping rate data need to be collected before informed decisions about groundwater movement in the Camdenton subsurface can be made. Static water levels should be measured at least monthly at any inactive wells. Detailed records of active wells should include volume of water pumped, length of pumping cycles, and drawdown measurements.

Aquifer Discontinuities

There are no aquifer discontinuities within a 4-mile radius of the site. Folds and faults in the area cannot be considered aquifer discontinuities for HRS scoring because their effects on groundwater movement are so poorly understood. Older faults have more highly-developed solution channels and may, therefore, act as groundwater conduits (Harvey et. al., 1983). Younger faults can actually act as aquitards, inhibiting groundwater flow

Wellhead Protection Area

The Former Hulett Lagoon site is located in a Wellhead Protection Area according to section 1428 of the Safe Drinking Water Act. In Missouri, Wellhead Protection Areas are designated by the Missouri Wellhead Protection Program. The Former Hulett Lagoon Area site is located within a 1-mile radius of a wellhead in a carbonate aquifer system (Public Drinking Water Program, 1994, page 15). The wellhead of concern is the Camdenton Airport Well.

Revisions to the 1994 Missouri Wellhead Protection Program document are currently under review by EPA. However, the Former Hulett Lagoon site should remain in a designated Wellhead Protection Area under any new management program that may be approved.

The Camdenton Sludge Disposal Area is located in Area 1, as designated by the DGLS Wellhead Protection Section. Since September 1987, Area 1 bedrock wells have been required to have 80 feet of casing and penetrate at least 30 feet of bedrock (Missouri Well Construction Rules, 1996).

Karst Features

The Camdenton Sludge Disposal Area is considered karst (Missouri Water Atlas, 1986). Significant karst features are present within a 4-mile radius of the site. Dissolution has caused the carbonate aquifers to be extremely heterogeneous (Harvey, et. al., 1983).

Geologic Structures

Geologic structures can influence groundwater movement (Harvey, et. al., 1983). The effects of the structural deformation on groundwater are poorly understood, but the faulting and folding has probably increased hydraulic conductivities in some areas. The northwest-trending structures in the Camdenton area tend to be older than northeast-trending structures. Northwest-trending structures may act as groundwater conduits.

Faults and folds have been mapped within the 4-mile groundwater target radius (Middendorf, 1984). Well log data suggest unmapped faults may also affect the area. A circular area of complex brecciation, known as the Decaturville Structure, lies just southwest of the 4-mile target radius (Wedge, in preparation). The Decaturville Structure is part of the Decaturville-Crooked Creek axis, a series of highly-faulted areas stretching eastward into Kentucky. The Mine Hollow Fault is shown on Figure 1 and located approximately 2/3 mile southeast of the Camdenton Sludge Disposal Area. The fault appears to radiate from the Decaturville Structure. The Mine Hollow Fault has a northeast trend and is downthrown approximately 60 feet to the northwest.

The axis of a northwest-trending syncline, called the Racetrack Hollow Syncline (Figure 1), has been mapped less than 2 miles west of the Camdenton Sludge Disposal Area (Middendorf, 1984). The Red Arrow Fault is located less than 3 miles southwest of the site (Wedge, in preparation). The Red Arrow Fault strikes northwest and, in general, the southwest side is downthrown approximately 100 feet. However, geology along the fault zone is complicated. LOGMAIN Well # 28602 (Figure 2) is located along the western portion of the fault zone and indicates significant upward movement. Ha Ha Tonka Spring is located along the trace of the Red Arrow Fault.

The poorly defined Proctor anticline runs across Camden County (McCracken, 1971). The Proctor Anticline changes to a fault in southern Camden County (Wedge, in prep.). The Proctor Fault (Figure 1) has been mapped less than 4 miles northeast of the Camdenton Sludge Disposal Area (Middendorf, 1984). The structure is probably related to a rejuvenated Precambrian fault.

Travel Time Factor

Rock layers that underlie the site are karst. The resulting Travel Time Factor Value is 35 (Federal Register, 1990).

GROUNDWATER TARGETS

Target Distance Limit

Groundwater use within the 4-mile groundwater target distance limit is extensive. Most residences near the Camdenton Sludge Disposal Area utilize private wells.

Wells

Over 92 drinking-water well locations within the groundwater target distance limit are recorded in the databases available at the Division of Geology and Land Survey. The LOGMAIN database contains information on older wells. The DGLS Well Wellhead Protection Section's Water Well Information System (W.I.M.S) database contains information on wells drilled since 1987. Additional information is available from the Public Drinking Water Program.Well, Missouri Department of Natural Resources, Division of Environmental Quality. Site locations are presented on Figure 4, and the corresponding well data is tabulated in Table 2. Some locations may be estimated or based on section centroids. The vast majority of the wells on record are domestic supply wells. Some wells may no longer be active. Many active wells may not be recorded in DGLS databases.

According to DEQ personnel and databases available at DGLS, one private well is located with ¼ mile of the Camdenton Sludge Disposal Area. 3 private wells are located with ¼ and ½ mile of the Former Hulett Lagoon Site. 2 wells are located between 0.5 and 1 mile of the site, including 1 community well and 1 private well. An additional 18 wells are located between 1 and 2 miles from the site, including 1 transient noncommunity well and 17 private wells. 30 wells are located between 2 and 3 miles from the site, 2 nontransient noncommunity wells and 28 private wells. 38 wells are located between 3 and 4 miles of the site including 2 community wells, 1 nontransient noncommunity well and 35 private wells.

Nearest Wells

It is likely that a large number of private wells in the area are not included in any DGLS database. The nearby wells mentioned here were located by DEQ personnel. The nearest well is located a few hundred feet west of the Camdenton Sludge Disposal Area at 3499 RR3 (County Road 5-120). Construction details for the well are not available.

Two private wells are located approximately ¼ mile southeast of the Camdenton Sludge Disposal Area. According to the owner, the well on the north side of County Road 5-

120, at 3496 RR3 was drilled in 1971 to a total depth of 528 feet with 40 - 45 feet of casing and the remainder open hole. Directly across the road from the 3496 RR3 residence is a third private well reported to have been drilled sometime between 1956 and 1958 to a total depth of 280 feet.
The nearest public drinking water supply well on record is Camden County Public Water Supply District #2 Well #1, known as the Camdenton Airport Well. The well is 848 feet deep and has 330 feet of casing. The well is illustrated on the Figure 2 cross-section. The Camdenton Airport Well is reportedly pumped only once per week. The Camden Co. PWSD #2 apparently obtains most of its water from Well #2, located approximately 3 miles south of the Camdenton Sludge Disposal Area.

SURFACE WATER PATHWAY

Hydrologic Setting

The Camdenton Sludge Disposal Area is situated near the crest of broad ridgetop that acts as the drainage divide between streams draining northwest, toward the Niangua Arm of the Lake of the Ozarks and streams draining east, toward the Dry Auglaize Creek. South and east of the site, unnamed streams flow southeast toward Forbes Branch. The natural landforms and drainage patterns at the site have been obscured by airport construction and soil disposal. The site itself has been leveled, while the surrounding terrain exhibits low natural relief (2% to 4% slopes). Land use patterns for the surrounding upland near the Camdenton Sludge Disposal Area include residential and agricultural properties with some light-industrial use. The steeper slopes are generally forested.

Rainfall Data

The average annual precipitation in the area of the Camdenton Sludge Disposal Area is slightly more than 37 inches. Average annual run-off is around 10 inches, and evapotranspiration amounts to about 28 inches per year; therefore, little precipitation is available for infiltration (Vandike, 1995). The 2-year, 24-hour rainfall for the area is about 3.5 inches (Rainfall Frequency Atlas, undated).

Surface Water Migration Path

Run-off from the Camdenton Sludge Disposal Area Site flows eastward toward Forbes Branch and Dry Auglaize Creek, both losing streams. Surface runoff would have to travel over 2.2 miles before reaching perennially-flowing water. Therefore, the potential to release by overland flow is not addressed in this document. Groundwater contamination is the main concern at the Camdenton Sludge Disposal Area Site.

Virtually all streams that have been evaluated near the Camdenton Sludge Disposal Area are losing. Losing streams include Forbes Branch, North Fork Linn Creek, and Racetrack Hollow. All are located less than 1 mile from the site. (Losing Stream File, 1999).

SURFACE WATER TARGETS

Drinking Water Intakes

No known direct intake of stream water is located within 15 downstream miles of the Camdenton Sludge Disposal Site (Missouri Public Water Systems, 1997).

SOIL / AIR PATHWAY

The Camdenton Sludge Disposal Site is now vegetated, and downstream or downwind receptors are not likely to be affected by the site itself.

The native soil in the vicinity of the Camdenton Sludge Disposal Area is the Lebanon silt loam (Wolf, 1994). Lebanon soils are deep, moderately well-drained soils typical of ridgetops. Permeability is moderate, although a shallow fragipan, if present, may perch water. Even if a fragipan is present, downward seepage is a potential concern.

The HRS Soil Group Designation from is C (Federal Register, 1990, Table 4-4).

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From:	Bill Jeffries
To:	Stroh, Michael
Subject:	RE: Camdenton Wastewater Treatment Plant
Date:	Monday, August 20, 2018 11:49:39 AM

There are 3 fulltime employees. Tom Emery is supervisor/operator, Billy Lee is his assistant and Ben Willerton checks the lift stations.

Bill Jeffries
Director, Public Works
Chief Water Operator C- DS III
City of Camdenton
573-346-7293
billj@camdentoncity.com

From: Stroh, Michael <michael.stroh@dnr.mo.gov>
Sent: Monday, August 20, 2018 9:31 AM
To: Bill Jeffries <billj@camdentoncity.com>
Subject: Camdenton Wastewater Treatment Plant

Bill,
I am gathering some information in preparation for our upcoming investigation at the former C.P. White Lagoon. Could you tell me how many full time/part time employees work at the city's wastewater treatment plant? Thanks.

Michael Stroh
Missouri Department of Natural Resources
P.O. Box 176, Jefferson City, MO 65102-0176
(573) 522-9902

From: Bill Jeffries
To: Stroh, Michael
Subject: RE: Old C.P. White Lagoon Footprint
Date: Friday, August 9, 2019 10:10:40 AM
Attachments: image001.png
lagoon.pdf

Attached is an aerial showing the old lagoon as well as piping. If you need any further info let me know.

Bill Jeffries
Director, Public Works
City of Camdenton
Chief Water Operator C-DSIII
573-346-7293

From: Stroh, Michael <michael.stroh@dnr.mo.gov>
Sent: Thursday, August 1, 2019 10:28 AM
To: Bill Jeffries <billj@camdentoncity.com>
Subject: Old C.P. White Lagoon Footprint

Thanks Bill, I've attached an aerial photo of the area as it looks now. If anyone there is able to draw in the approximate boundary (and inlet) of the old lagoon, that would be very helpful. It's been my understanding that the current plant structures overlie a portion of the former lagoon.

Michael Stroh
Missouri Department of Natural Resources
P.O. Box 176, Jefferson City, MO 65102-0176
(573) 522-9902


Lagoon
Legend
Inflow
Pipe
Outfall
Google Earth
©2018 Google
N
300 ft

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 176
Jefferson City, Missouri 65102

In the Matter of:	)	
Modine Manufacturing Company	)	
179 Sunset Drive	)	
P.O. Box 636	)	
Camdenton, MO 65020	)	
	)	
	)	Order No. 99-HW-002
Proceeding Under the Missouri	)	
Hazardous Waste Management Law	)	
Section 260.410, RSMo	)	

CORRECTIVE ACTION ABATEMENT ORDER ON CONSENT

TO: Modine Manufacturing Company, 179 Sunset Drive, P.O. Box 636, Camdenton, MO 65020

TABLE OF CONTENTS

SECTION I. DEFINITIONS

1. For purposes of this Order, terms used herein shall have the same meaning as those in the Hazardous Waste Management Law and 40 CFR Parts 124, 260, 261, 265, 268, and 270, which are incorporated by reference in 10 CSR 25-3.260 and Section 260.360, RSMo, unless this Order specifically provides otherwise. Where terms are not defined in the Hazardous Waste Management Law, the regulations, the Order, or EPA guidance or publications, the meaning associated with such terms shall be defined by a standard dictionary reference, or the generally accepted scientific or industrial meaning of the term. Additional terms as used herein are defined as follows:

2. Area of Concern (AOC) means an area where an actual or potential release of hazardous waste or hazardous constituents which is not from a solid waste management unit, is occurring and is determined by the Department to pose a current or potential threat to human health or the environment. Investigation and/or remediation of Area(s) of Concern may be required pursuant to Sections 260.375 and 260.395, RSMo, and 40 CFR 270.32(b)(2), as incorporated by reference in 10 CSR 25-7.270(1).

3. Day shall mean a calendar day unless expressly stated to be a business day. 'Business day' shall mean a day other than Saturday, Sunday, or Federal holiday. In computing any period of time under this order, where the last day would fall on a Saturday, Sunday, or Federal holiday, the period shall run until the end of the next business day.

4. Director means the Director of the of Missouri Department of Natural Resources, Division of Environmental Quality.

5. Department shall mean the Missouri Department of Natural Resources.

6. Facility means: All contiguous land and structures, other appurtenances, and improvements on the land, used for treating, storing, or disposing of hazardous waste. All contiguous property under the control of the owner/operator, for the purpose of implementing corrective action under 40 CFR 264.101, as incorporated by reference in 10 CSR 25-7.264(1) and in this Order.

7. Hazardous Constituent means any constituent identified in Appendix VIII of 40 CFR Part 261, as incorporated in 10 CSR 25-4.261.

8. Hazardous Waste means any waste, or combination of wastes as defined by or listed in 10 CSR 25-4 or 10 CSR 25-11, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause or significantly contribute

to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or which may pose a threat to the health of humans or other living organisms.

9. Interim Measures or IM shall mean those actions taken to control or abate threats to human health and/or the environment, address source areas and prevent or minimize the further spread of contamination prior to the implementation of a final remedy.

10. Modine shall mean Modine Manufacturing Company, located at 179 Sunset Drive, Camdenton, Camden County, Missouri.

11. RCRA shall mean the Solid Waste Disposal Act, as amended by, 42 U.S.C. 6901, et seq.(also known as the Resource Conservation and Recovery Act).

12. Release means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous wastes (including hazardous constituents) into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing hazardous wastes or hazardous constituents).

13. Solid Waste Management Unit (SWMU) means any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released.

14. Stabilization means actions to control or abate threats to human health and/or the environment from releases at a Hazardous Waste Management Facility and/or to prevent or minimize the further spread of contamination while long-term remedies are pursued.

SECTION II. STATEMENT OF PURPOSE

15. In entering into this Corrective Action Abatement Order on Consent, the mutual objectives of the Department and Modine, are: (1) to Perform Interim Measures (IM), at the Facility to abate threats to human health and/or the environment, as necessary; (2) to perform a RCRA Facility Investigation (RFI) consistent with the RFI Statement of Work attached in Appendix B, and by this reference, incorporated herein, and any amendments thereto to determine fully the nature and extent of any release of hazardous waste and/or hazardous constituents at or from the Facility; (3) to perform a Corrective Measures Study (CMS), as determined by the RFI,, to identify and evaluate corrective measures alternatives as necessary to prevent, mitigate and/or remediate any releases of

hazardous waste or hazardous constituents at or from the Facility; and (4) if necessary, negotiate a second corrective action order to implement the selected corrective measures.

SECTION III. PARTIES BOUND

16. This Order shall apply to and be binding upon the Department, Modine and its officers, directors, employees, agents, successors and assigns, heirs, trustees, and receivers acting under or on behalf of Modine.

17. Modine shall be responsible for and liable for any failure to carry out any activities required of Modine pursuant to this Order, regardless of Modine's use of employees, agents, contractors, or consultants to perform such tasks.

18. No change in ownership or corporate or partnership status relating to the Facility shall in any way alter Modine's responsibility under this Order. Modine shall give written notice of this Order to any successor in interest prior to transfer of ownership or operation of the Facility (or any portion thereof) and shall notify the Department in writing thirty (30) days prior to such transfer.

19. Modine shall provide a copy of this Order to all contractors, laboratories, and consultants retained to conduct or monitor any portion of the work performed pursuant to this Order within fourteen (14) days of the retention of such contractor and shall condition all such contracts on compliance with the terms of this Order.

20. Modine agrees to undertake all actions required by this Order.

SECTION IV. FINDINGS OF FACT

21. In addition to the findings of fact contained within this Order, an administrative record is maintained within the Department's files for this Facility and in support of this Order.

22. Modine Manufacturing Company is a Wisconsin based corporation that operates and conducts business in the state of Missouri. The Facility was originally owned and operated by Dawson Metal Products from 1967 to 1972. Sundstrand Tubular Products purchased the Facility in 1972, and continued operating it until 1990. In October 1990 the Facility was purchased by Modine Heat Transfer, Inc., a wholly owned subsidiary of Modine Manufacturing Company, Racine, Wisconsin. Modine Heat Transfer, Inc. merged with Modine Manufacturing Company on April 1, 1997; thus, changing its name to Modine Manufacturing Company. Modine is the current owner/operator of the Facility. The site has been used to manufacture air-conditioning

coils and feeder parts from aluminum and copper tubing.

23. Modine is located on Sunset Drive in Camdenton, Missouri and occupies approximately 67 acres and is zoned industrial. The legal description for the site is: NE 1/4, NE 1/4, Sec. 26, T. 28 N., R. 17 W., Green Bay Terrace Quadrangle, Camden County, Missouri (Figure 1).

24. The site is bordered by residences to the northwest, north, and east, and is bordered by a wooded ravine to the southwest. The nearest residences are 20 feet east of the site. Additional residential dwellings exist beyond the wooded ravine area to the southwest, within 1 mile of the Facility. The nearest municipal well is located 1/4 mile southeast of the site. Ha Ha Tonka Spring is located approximately 2.5 miles south of the Facility.

25. Sundstrand Tubular Products, Inc. submitted a completed Resource Conservation and Recovery Act Hazardous Waste Part A Permit Application, dated November 10, 1980, to the Environmental Protection Agency (EPA). The permit application identified several hazardous wastes generated by the Facility. These hazardous wastes are identified by the following waste codes: F001, F006, F007, F009, and D001.

26. EPA sent a letter dated December 19, 1980, to Sundstrand Tubular Products, Inc. acknowledging receipt of Sundstrand's Part A Permit Application and accepting the application as its initial qualification for interim status as a Treatment/Storage/Disposal (TSD) Facility.

27. Prior to the purchase of the site by Modine, Sundstrand Tubular Products Inc. submitted a Closure Plan, dated September 4, 1990, to the Department, to close its interim status storage units and to operate in the future as a generator, only.

28. A Departmental letter dated September 14, 1990, addresses Sundstrand's September 4, 1990, letter. The Department's letter states that "Sundstrand could proceed at their own risk with the closure activities identified in their closure plan prior to closure plan approval by MDNR. Any modifications to this closure plan or any additional requirements will have to be implemented subsequent to closure plan approval by MDNR."

29. Modine notified the Department and EPA of the ownership change, described above in Paragraph 20, in a RCRA Part A Permit application and letter dated December 3, 1990.

30. Jacobs Engineering Group, Inc. (Jacobs), a contractor for EPA conducted

a RCRA Facility Assessment (RFA) for EPA at the Facility and submitted to EPA the final Environmental Priorities Initiative/Preliminary Assessment (EPI/PA) report dated October 28, 1992. The EPI/PA identified 23 Solid Waste Management Units (SWMUs) and 7 Areas of Concern (AOCs) as actual or potential sources of releases of hazardous waste or hazardous constituents to the environment. The EPI/PA Report findings indicated that the AOCs Jacobs identified did not appear to require any additional work. However, according to the EPI/PA, 6 SWMU's required additional action to address environmental concerns.

31. On November 12, 1992, the Department approved the September 4, 1990 Closure Plan submitted by Sundstrand with modifications. The modifications required that additional sampling be performed at their interim status storage units.

32. Modine submitted a Closure Report dated September 9, 1993, to the Department, outlining results from a July 1993, sampling conducted pursuant to the approved Closure Plan.

33. During a telephone conversation with Modine on June 15, 1994, the Department notified Modine that the closure standards outlined in the approved closure Plan were not met by Modine. Modine then requested that MDNR allow Modine to conduct a risk assessment for risk based closure. The Department sent a follow up letter, dated June 16, 1994, to Modine agreeing that Modine could do a risk assessment .

34. Modine submitted a report entitled "Environmental Risk Assessment of former Drum Storage Areas" dated August 16, 1994. The report was prepared for Modine by Law Engineering and Environmental Services.

35. On December 7, 1994, MDNR conducted a groundwater sampling investigation of two monitoring wells installed by MDNR in July 1992. The analytical results revealed that monitoring well MW-1 contained Trichloroethene (TCE) at 6.9 parts per billion (ppb) and monitoring well MW-2 contained TCE at 5.1 ppb. These results were above the Drinking Water Maximum Contaminant Level (MCL) of 5 ppb for TCE. Upon retesting monitoring well MW-2, TCE levels were non-detect and below the 5 ppb MCL. In subsequent tests, TCE was detected in MW-1 at levels up to 11.8 ppb, and TCE remained non-detect in MW-2.

36. Modine submitted a "Work Plan Modification" for an investigation to achieve final closure of the interim status TSD Facility. The Work Plan Modification was dated June 1, 1995. The Work Plan Modification was submitted to address the following: the lead contaminated soil at boring B-11, which is located at the southwest corner of the former Tank and Drum Storage Area 2; to install 1 additional groundwater monitoring

well; and to sample the soil to identify the extent of contamination.

37. The Department approved Modine's Closure Plan Modification Request in a letter dated September 5, 1995.

38. Modine submitted a report of its findings entitled "Findings of an Investigation to Achieve Final Closure of the Interim TSD Facility" dated February 12, 1996. In summary, the results of the work revealed that the lead contaminated soil at boring B-11 was removed, with residual levels remaining in place below draft Missouri Department of Health (MDOH) Any Use Soil Levels (ASLs); two (2) additional groundwater monitoring wells known as MW-3 and MW-4 were installed, and the samples taken during well installation revealed that hazardous constituents were present; soil borings in and around the employee parking lot revealed that the following levels of TCE at 3.5 ppb to 204,000 ppb, Tetrachloroethane at 2180 ppb, 1,1-Dichloroethene at 10.9 ppb, and Methylene Chloride at 13 ppb to 29 ppb were present in the soil.

39. Modine submitted a "Work Plan for an Investigation for the Fracture System" dated April 26, 1996. The purpose of this investigation was to determine the presence and nature of potential chemical migration pathways associated with fractures or joints in the bedrock underlying the Facility.

40. A telephone log dated May 6, 1996 indicates that the Department telephoned Modine in reference to the April 26, 1996 "Work Plan of an Investigation of the Fracture System". The Department informed Modine that the Department had no comments on the Work Plan and that Modine should proceed as planned.

41. Modine submitted a final report entitled "Fracture System Investigation" dated July 17, 1996. The report concludes that the preferred fracture direction trends directly toward the former Hulett Lagoon, owned by the City of Camdenton, located northeast of the Facility. Therefore, Modine contends, the possibility exists that TCE is migrating onto the Modine Facility due to releases from the former Hulett Lagoon through the vertical fractures located within the subsurface.

42. On November 4, 1996, Modine submitted a report summarizing a subsurface investigation conducted at the location of the former Hulett Lagoon on property owned by the City of Camdenton. Sampling results and analyses show levels of TCE as high as 9,170 ppb and chloroform as high as 200 ppb in soil.

43. The Department sent a letter to Modine dated November 25, 1996, requiring Modine to provide the Department with either a written commitment to perform additional investigation including continued groundwater monitoring or a post closure plan including

specifications for groundwater monitoring and a cost estimate for post-closure care.

44. A Departmental letter to Modine dated March 20, 1997, outlined the general nature and scope of corrective action requirements necessary at the Facility. Following further review of the EPI/PA report and Facility files the Department has determined that four (4) SWMUs require additional investigation to address environmental concerns. They are: SWMU 2 (Mudpits), SWMU 4 (Tank and Drum Storage Area Number 1), SWMU 5 (Tank and Drum Storage Area Number 2), and SWMU 31 (Drum Storage Area Number 3) shown on the Facility map attached to this Order as Figure 2, and by this reference, incorporated herein.

SWMU 2 - Mudpits

45. Four mudpits (sumps) were utilized by the Facility from 1967 to 1986. The mudpits were connected by a 6-inch steel line that delivered storm water from 1979 to 1983, eliminated in 1983), boiler water and cleaning line waste to the Hulett Lagoon via the city sewer system. The mudpits were located adjacent to the manufacturing building (Figure 2). Each mudpit consisted of a 4 foot by 4 foot by 4 foot deep cement sump. Each sump received the previous sumps' wastes until discharged into the sewer. The southern most mudpit (mudpit #4) was an open pit that collected boiler water and storm water. Mudpit #3 collected aluminum cleaning line waste and storm water from mudpit #4. Mudpit #1 collected copper cleaning line waste in addition to aluminum cleaning line waste and storm water from the first two mudpits. Mudpit #2 no longer exists and was located beneath what is now the pre-treatment/drum storage area. Hulett Lagoon potentially received Hazardous Waste from the Modine Facility's 4 mudpits and associated piping, identified by the following Hazardous Waste codes: F006, D002, and D098. Residual contaminants associated with degreasing operations at the Facility, including TCE, did enter the wastewater collection system and the Mudpits.

SWMU 4 - Tank and Drum Storage Area Number 1

46. Tank and Drum Storage Area Number 1 was used by the Facility from 1972 to 1977. The area is located approximately 80 feet from the main building to the west of the manufacturing building (Figure 2). It was constructed of a gravel and clay mixture over a clay fill and was approximately 25 feet wide by 30 feet long. Up to 45 55-gallon drums of liquid and sludge were stored at any one time at this drum storage area.

47. Hazardous Wastes managed in this area included TCE still bottoms (F001), waste paint filters and liquid (D001), and non-hazardous waste oil. Plastic drum covers were placed on the drums to prevent contamination or precipitation from entering the drums.

48. Removal of this storage area in 1983 was not approved by the Department. Releases of VOCs were identified in the vicinity of SWMU 4 by LAW Environmental, Inc., (LAW) as part of an Environmental Site Assessment (ESA), in November 1991. Modine's report entitled "Findings of an Investigation to Achieve Final closure of the Interim TSD Facility" dated February 12, 1996 revealed soil concentrations of TCE up to 204,000 ppb in the vicinity of SWMU 4. This soil boring is located 150-200 feet to the southwest of the unit. The source(s), horizontal and vertical extent and any relationship of these releases to the groundwater contamination beneath the Facility are currently unknown. Given the hazardous waste storage activities conducted at this unit and the analytical results for soil samples obtained in the vicinity, further investigation is warranted.

SWMU 5 - Tank and Drum Storage Area Number 2

49. Tank and Drum Storage Area Number 2 is located 10 feet from the west wall of the manufacturing building (Figure 2). This storage area was used from 1983 to 1985. The area was constructed of a 25 feet by 30 feet steel reinforced concrete slab and an 8-inch containment wall. In addition to holding up to 20 55-gallon drums, the area also contained two storage tanks. A 1,000 gallon steel tank held waste oil (D098) and a 5,300 gallon steel tank was used for the storage of the raw material solvent TCE. Plastic drum covers were placed on the drums to prevent contamination and precipitation from entering the drums. This area was removed in 1985 to make room for a waste water pre-treatment system. TCE and other VOCs have been detected at SWMU 5.

SWMU 31 - Tank and Drum Storage Area Number 3

50. Tank and Drum Storage Area Number 3 was used by the Facility from 1979 to 1983 and was located at the southern end of the manufacturing building (Figure 2). It was constructed of a base rock and clay mixture and was 25 feet wide by 50 feet long. This area was removed in 1983 for expansion of the manufacturing building. Removal activities for this storage area are not known and were not reviewed or approved by MDNR. This area was used to store old, obsolete equipment ready for scrapping. Wash-out water and soda ash from a degreaser clean out (unknown TCE content) in drums was stored in the area for a limited time period.

51. LAW Environmental, Inc., extracted 5 samples from this area as part of the November, 1991 ESA. The samples showed that 1,1 Dichloroethene; 1,2,Dichloroethane; Chloroform; 1,1,1-Trichloroethane; TCE; Vinyl Chloride; Trichlorofluoromethane; Methylene Chloride; trans-1,2-Dichloroethene; and 1,1,2-Trichloroethane were in the soil at this SWMU.

52. At the time of the ESA, perched groundwater (or more likely water in the coarse-grained subgrade material for the building foundation) flowed from two of the borings installed through the building foundation. This water was sampled and shown to contain 1,1 Dichloroethane; Total 1,2,Dichloroethene; 1,1,1-Trichloroethane; TCE; and Methylene Chloride. The source(s), horizontal and vertical extent and any relationship of these releases to the deeper groundwater contamination beneath the Facility are currently unknown.

53. A Modine letter report entitled "Subsurface Investigation Monorail Vapor Degreaser and Still M567 (SWMU 26) and former Drum Storage Area Number 3 (SWMU 31)" dated May 21, 1997 provided MDNR with sampling and analysis results from subsurface sampling of the Monorail Vapor Degreaser and Still M567 (SWMU 26) and Former Drum Storage Area Number 3 (SWMU 31). Sample results from that letter report indicate that hazardous waste and/or hazardous constituents remain in the soil and water found in the subgrade beneath and adjacent to the building. Sample analysis revealed the following levels of hazardous constituents in the soil: Methylene Chloride (110 ppb); Acetone (120 ppb); 1,1-Dichloroethene (770 ppb); 1,1-Dichloroethane (79 ppb); Total 1,2-Dichloroethene (96 ppb); 1,1,1-Trichloroethane (6,000 ppb); TCE (4,000 ppb); and Tetrachlorethane (14 ppb).

54. The letter report also included an analysis of water found in the building subgrade which indicated the presence of hazardous constituents beneath the manufacturing building: Methylene Chloride (3,300 ppb); Acetone (2,200 ppb); 1,1-Dichloroethene (22,000 ppb); 1,1-Dichloroethane (17,000 ppb); Total 1,2-Dichloroethene (160 ppb); 1,1,1-Trichloroethane (21,000 ppb); TCE (1,300 ppb); and Butanone (2,000 ppb).

55. Modine submitted a report entitled "Subsurface Investigation, Out of Service Mudpit Locations", dated December 3, 1997 resulting from additional voluntary investigation/remediation efforts. The analysis of Geoprobe soil samples taken at the mudpits shows increasing photoionization detector (PID) screening readings and laboratory analysis of these samples indicated increasing TCE concentrations (30 ppb to 900 ppb) with increasing depth. Although, TCE concentrations were below the Missouri Department of Health's (MDOH) proposed ASLs for residential settings which are based solely on soil ingestion, some of the TCE soil concentrations exceed Superfund's Soil Screening Levels (SSLs) for transfers to groundwater. Lead concentrations significantly above MDOH's proposed ASL OF 240,000 ppb for lead were detected in soil samples obtained from geoprobes P-1 (565,000 ppb), P-4 (1,240,000 ppb), and P-9 (314,000 ppb). The Geoprobes were advanced to a maximum depth of 10 feet.

56. Modine submitted a report entitled "Out of Service Mud Pits Excavation", dated December 7, 1997. Soil surrounding mudpits #1, #3, and #4 and debris from the mudpits (i.e., cement lining, PVC piping, and scrap metal) were excavated to address lead contaminated soil and other materials. The excavated soil was stockpiled on-site and was analyzed via the Toxicity Characteristic Leaching Procedure (TCLP) (EPA SW-846 Method 1311) for disposal characterization purposes. Approximately, 13 tons of the soil failed TCLP and was disposed of off-site as hazardous waste. 184 tons were disposes off-site as special waste. Due to the close proximity of the excavation to a sprinkler main and the outer wall of the manufacturing building, an unknown amount of contaminated soil was left in place. Confirmatory soil sample results taken from the north, south, east, and west walls and the base of the excavation, showed lead in the soil at 541,000 ppb, 601,000 ppb, 901,000 ppb, 1,460,000 ppb, and 251 ppb, respectively.

SECTION V. - CONCLUSIONS OF LAW AND DETERMINATIONS

57. Based on the foregoing findings of fact and after consideration of the administrative record, the Director makes the following conclusions of law and determinations:

A. Pursuant to the authority vested in the Director of the Missouri Department of Natural Resources this Corrective Action Abatement Order on Consent is issued to Modine Manufacturing Company in accordance with the Missouri hazardous Waste Management Law including but not limited to Sections 260.350, 260.375(15), 260.394, 260.395, 260.410, 260.420, 260.425, and 260.530, et seq. RSMo.

B. Respondent is a "person" within the meaning of Section 260.360, RSMo.

C. Respondent is the owner or operator of a facility that has operated or is operating subject to the interim status requirements of the Missouri Hazardous Waste Management Law, Section 260.395.15, RSMo and 10 CSR 25-7.265.

D. Certain wastes and constituents found at the Facility are hazardous wastes or hazardous constituents as defined by Section 260.360, RSMo and the regulations at 40 CFR Parts 260 and 261, incorporated by reference in 10 CSR 25-3.260 and 4.261.

E. There is or has been a release of hazardous wastes or hazardous constituents into the environment from the Facility.

F. The actions required by this Order are necessary to protect human health and/or the environment.

SECTION VI. - WORK TO BE PERFORMED

58. Pursuant to Sections 260.350, 260.375(15), 260.394, 260.395, 260.410, 260.420, 260.425, and 260.530, et seq. RSMo. and/or 40 CFR 264.101, as incorporated by reference in 10 CSR 25-7.264(1), Modine agrees, and is hereby ordered, to perform the following acts in the manner and by the dates specified herein.

59. Modine shall notify the Department and EPA in writing of any newly-identified SWMU(s) or AOC(s) identified subsequent to the issuance of this Order no later than 15 days after discovery. A newly-identified SWMU or AOC is one that has not been previously identified and has been discoverred unexpectedly during the course of groundwater monitoring, field investigation, environmental auditing or other activities.

60. The Department may require a SWMU/AOC Assessment Work Plan for conducting an investigation of any newly-identified SWMU(s) or AOC(s). Within 60 days after receipt of the Department's request for a SWMU/AOC Assessment Work Plan, Modine shall submit a SWMU/AOC Assessment Work Plan which shall include a discussion of past waste management practices at the unit, as well as a sampling and analysis program for groundwater, land surface and subsurface strata, surface water, and/or air, as necessary to determine whether a release of hazardous waste, including hazardous constituents, from such unit(s) has occurred, or is occurring. The sampling and analysis program shall be capable of yielding representative samples and shall include monitoring parameters sufficient to assess the release of hazardous waste and/or hazardous constituents from the newly-identified SWMU(s)/AOC(s) to the environment. The SWMU/AOC Assessment Work Plan shall specify any data to be collected to provide for a complete SWMU/AOC Assessment Report, as specified below.

61. The SWMU/AOC Assessment Work Plan will be reviewed in accordance with the procedures set forth in Section VII (Review and Approval Procedures). Modine shall initiate implementation of the plan within 60 days of receipt of Departmental approval and shall complete implementation thereof in accordance with the schedule contained in the approved plan.

62. Modine shall submit a SWMU/AOC Assessment Report to the Department and EPA according to the schedule specified in the approved SWMU/AOC Assessment Work Plan. The SWMU/AOC Assessment Report shall present and discuss the information obtained from implementation of the approved SWMU/AOC Assessment Work Plan. At a minimum, the SWMU/AOC Assessment Report shall provide the

following information for each newly-identified SWMU/AOC:

A. The location of the newly-identified SWMU/AOC in relation to any other SWMUs/AOCs;

B. The type and function of the unit;

C. The general dimensions, capacities, and structural description of the unit;

D. The period during which the unit was operated;

E. The physical and chemical properties of all wastes that have been or are being managed at the SWMU/AOC, to the extent available;

F. The results of any sampling and analysis conducted;

G. Past and present operating practices;

H. Previous uses of the area occupied by the SWMU/AOC;

I. Amounts of waste handled; and

J. Drainage areas and/or drainage patterns near the SWMU(s)/AOC(s).

63. The SWMU/AOC Assessment Report will be reviewed in accordance with the procedures set forth in Section VII (Review and Approval Procedures). Based on the findings of this report, the Department will determine the need for further investigations, including stabilization, a RCRA Facility Investigation (RFI), and/or a Corrective Measures Study (CMS), at specific unit(s) identified in the SWMU/AOC Assessment Report.

64. If the Department determines that additional investigation is necessary, the Department will notify Modine in writing as to the nature of the additional investigation and the basis for its determination. Within thirty (30) days after the receipt of such notice, Modine will have the opportunity to meet with the Department to discuss the additional investigation. If the parties reach an agreement, said agreement shall be memorialized in writing and shall be a modification of this Order pursuant to paragraph 145 of this Order. Modine shall submit a Work Plan withing 30 days of the date the agreement is signed by the Department for additional investigations which will be reviewed in accordance with the procedures set forth in Section VII (Review and Approval Procedures). Modine shall initiate implementation of the plan within 60 days of receipt of Departmental approval and

shall complete implementation in accordance with the schedule contained in the plan.

65. Modine shall notify the Department and EPA, in writing, of any newly-identified release(s) of hazardous waste, including hazardous constituents, from previously-identified SWMUs and AOCs identified subsequent to the issuance of this Order no later than 15 days after discovery. A newly-identified release from a previously identified SWMU or AOC is one that has been unexpectedly discovered during the course of groundwater monitoring, field investigation, environmental audit or other activities.

66. The Department may require a Newly-Identified Release Work Plan for conducting an investigation of the newly-identified release(s). Within 60 days after receipt of notice that the Department requires a Newly-Identified Release Work Plan, Modine shall submit a Newly-Identified Release Work Plan which shall include a discussion of the waste/chemical management practices related to the release; a sampling and analysis program for groundwater, land surface and subsurface strata, surface water or air, as necessary to determine whether the release poses a threat to human health or the environment; and a proposed schedule for implementation and completion of the Newly-Identified Release Work Plan. The sampling and analysis program shall be capable of yielding representative samples and shall include monitoring parameters sufficient to assess the release of hazardous waste and/or hazardous constituents to the environment. The Newly-Identified Release Work Plan shall specify any data to be collected to provide for a complete Newly-Identified Release Report, as specified below.

67. The Newly-Identified Release Work Plan will be reviewed in accordance with the procedures set forth in Section VII (Review and Approval Procedures). Modine shall initiate implementation of the plan within 60 days of receipt of Departmental approval and shall complete implementation in accordance with the schedule contained in the plan.

68. Modine shall submit a Newly-Identified Release Report to the Department and EPA according to the schedule specified in the approved Newly-Identified Release Work Plan. The Newly-Identified Release Report shall present and discuss the information obtained during implementation of the approved Newly-Identified Release Work Plan. At a minimum, the report shall provide the following information for each newly-identified release:

A. The location of the newly-identified release in relation to any other SWMU(s)/AOC(s);

B. The general dimensions of the release;

C. The period during which the release is suspected to have occurred;

D. The physical and chemical properties of all wastes that comprise the release;

E. The results of any sampling and analysis conducted;

F. Past and present operating practices near and at the location of the release;

G. Previous uses of the area(s) occupied near and at the location of the release;

H. Amounts of waste handled near and at the location of the release; and

I. Drainage areas and/or drainage patterns near and at the location of the release.

69. The Newly-Identified Release Report will be reviewed in accordance with the procedures set forth in Section VII (Review and Approval Procedures). Based on the findings of the report and any other available information, the Department will determine the need for further investigation, including stabilization, an RFI, and/or a CMS.

Stabilization

70. If Modine becomes aware of a situation that may require stabilization measures to protect human health and the environment, Modine shall notify the Department and EPA within 24 hours of the time Modine becomes aware of the situation.

71. If during the course of any activities initiated under this Order, Modine or the Department determines that a release or potential release of hazardous waste, including hazardous constituents, poses a threat to human health or the environment, the Department may require stabilization measures to slow or stop the further spread of contamination until final corrective action measures can be implemented. Modine may prepare, within 10 calender days of notification, a plan, or the Department will determine the specific action(s) that shall be taken to implement stabilization and the schedule for implementing the stabilization requirements. If the Department makes the determination, the Department will inform Modine of decisions regarding the action(s) in writing.

72. If at any time, Modine determines that the stabilization program is not effectively limiting or stopping the further spread of contamination, Modine shall notify

the Department and EPA in writing no later than ten (10) calendar days after such a determination is made. The Department may require that the stabilization program be revised to make it effective in limiting or stopping the spread of contamination, or that final corrective action measures are required to remediate the contaminated media.

RCRA Facility Investigation (RFI) Work Plan

73. Within 60 days of the effective date of this Consent Order, Modine shall submit to the Department and EPA an RFI Work Plan. The RFI Work Plan is subject to approval by the Department and shall be developed in a manner that addresses all environmental concerns outlined herein and that considers all investigations and data collected to date by Modine. The RFI Work Plan shall contain provisions which are designed to meet the following objectives:

A. Full characterization of the nature, vertical and horizontal extent, and rate of migration of releases of hazardous waste and/or hazardous constituents from existing or newly identified SWMUs/AOCs or newly identified release(s) at the Facility and the actual or potential receptors of such releases; and

B. Collection of any other pertinent data which may be utilized to substantiate future corrective action decisions.

In the RFI Statement of Work, Appendix B, Modine has propsed doing two dye traces. Modine may submit a detailed Work Plan for the on-site dye trace to the MDNR prior to submitting or as part of the RFI Work Plan. Once the MDNR reviews and approves the on-site dye trace Work Plan pursuant to Section VII (Review and Approval Procedures), the Work Plan and any resulting data and other information shall be incorporated into the RFI Work Plan and it implementation.

74. The content of the RFI Work Plan shall be appropriate for site-specific conditions and shall be consistent with and address all applicable investigation elements described in the most recent version of the EPA guidance document entitled, RCRA Facility Investigation Guidance; EPA 530/SW-89-031, May 1989. At a minimum, the RFI Work Plan shall detail all proposed activities and procedures to be conducted at the Facility, a description of current conditions, the schedule for implementing and completing such investigations, and for submission of reports (including the final RFI Report), the qualifications of personnel performing or directing the investigations, including contractor personnel, and the overall management of the RFI.

75. The RFI Work Plan shall include a Quality Assurance Project Plan (QAPP).

The QAPP shall present the policies, organization, objectives, functional activities, and specific quality assurance and quality control activities designed to achieve the data quality goals of the RFI. It shall include the RFI objectives, sampling procedures, analytical methods, field and laboratory quality control samples, chain-of-custody procedures and data review, validation and reporting procedures.

76. Modine shall prepare and maintain a health and safety plan during the project that assures the RFI activities are conducted in a manner that is not harmful to human health or the environment.

77. Due to the complexity of defining the extent of contamination, Modine may be required to use a phased approach, which will require the submittal of supplemental RFI Work Plans. The Department and Modine will attempt to reduce the need for Supplemental RFI Work Plans.

78. The RFI Work Plan(s) will be reviewed in accordance with the procedures set forth in Section VII (Review and Approval Procedures). Modine shall initiate implementation of the plan(s) within 60 days of receipt of Departmental approval and shall complete implementation in accordance with the schedules contained in the plan(s).

RCRA Facility Investigation (RFI) Report

79. Modine shall submit a RFI Report to the Department and EPA in accordance with the schedule contained in the approved RFI Work Plan. The RFI Report shall present all information gathered under the approved RFI Work Plan along with a brief Facility description and map showing the property boundary and all SWMUs/AOCs. The information presented in the RFI Report shall be presented in a form that is consistent with Section 5 of the most recent version of the EPA publication entitled, RCRA Facility Investigation Guidance; EPA 530/SW-89-031, May 1989.

80. The RFI Report shall provide an interpretation of the RFI information gathered, supported with adequate documentation, to enable the Department to determine whether additional stabilization and/or a CMS may be necessary. The RFI Report shall describe the procedures, methods, and results of all investigations of SWMUs/AOCs and associated releases, including, but not limited to, the following:

A. Characterization of the nature, concentration(s), horizontal and vertical extent, and direction/rate of movement of releases from SWMUs/AOCs at the Facility;

B. Characterization of the environmental setting of the Facility,

including:

1. Hydrogeological conditions;
2. Climatological conditions;
3. Soil and bedrock characteristics;
4. Surface water and sediment quality; and
5. Air quality and meteorological conditions;

C. Characterization of SWMUs/AOCs from which releases have been or are occurring, including unit and waste characteristics;

D. Descriptions of human and environmental receptors which are, may have been, or, based on site-specific circumstances, could be exposed to release(s) from SWMUs/AOCs;

E. Information that will assist the Department in assessing risks to human health and the environment from releases from SWMUs/AOCs;

F. Extrapolations of future contaminant movement;

G. Laboratory, bench-scale, pilot-scale, and/or appropriate tests or studies to determine the feasibility or effectiveness of treatment technologies or other technologies that may be appropriate in implementing remedies at the Facility;

H. Statistical analyses to aid in the interpretation of data; and

I. Results of any stabilization measures previously implemented.

81. The RFI Report will be reviewed in accordance with the procedures set forth in Section VII (Review and Approval Procedures). After review of the RFI Report, if the Department determines that the objectives of the RFI have not been met, the Department may require additional investigation. Upon approval of the RFI Report by the Department, the Department shall advise Modine as to the next step in the corrective action process which may include submittal of a CMS Work Plan.

Corrective Measures Study (CMS) Work Plan

82. If the Department determines that a release(s) of hazardous waste and/or hazardous constituents from newly and/or previously-identified SWMUs/AOCs pursuant

to paragraphs 73 through 81 of this Order, or long-term groundwater monitoring results, may present a threat to human health and/or the environment, the Department may require Modine to prepare and submit a CMS Work Plan and will notify Modine in writing of this decision. This notice will identify the hazardous constituent(s) of concern and may specify remedial alternatives to be evaluated by Modine during the CMS.

83. The Department may require Modine to identify and evaluate, as part of the CMS, one or more specific potential remedies for removal, containment, and treatment of hazardous waste, including hazardous constituents in contaminated media based on the objectives established for the corrective action. These remedies may include a specific technology or combination of technologies that, in the Department's judgment, may be capable of achieving standards for protection of human health and/or the environment.

84. Modine shall submit a CMS Work Plan to the Department and EPA within 45 days of notification of the requirement to conduct a CMS. The CMS Work Plan shall be consistent with guidance contained in the most recent version of the EPA document entitled: RCRA Corrective Action Plan; OSWER Directive 9902.3-2A, May 1994. At a minimum, the CMS Work Plan shall provide the following information:

A. A description of the general approach to investigating and evaluating potential remedies;

B. A definition of the specific objectives of the study;

C. A description of the remedies which will be studied;

D. A description of those potential remedies which were preliminarily considered, but were dropped from further consideration, including the rationale for elimination;

E. The specific plans for evaluating remedies to ensure compliance with remedy standards;

F. The schedules for conducting the study and submitting a CMS Report;

G. The proposed format for the presentation of information; and

H. Laboratory, bench-scale, pilot-scale, and/or appropriate tests or studies to determine the feasibility or effectiveness of treatment technologies or other technologies that may be

appropriate in implementing remedies at the Facility.

85. The Department will review the CMS Work Plan in accordance with the procedures set forth in Section VII (Review and Approval Procedures). Modine shall initiate implementation of the plan within 60 days of receipt of Departmental approval and shall complete implementation in accordance with the schedule contained in the plan.

Corrective Measures Study (CMS) Report

86. If the Department determines that a CMS Work Plan is necessary to address a release(s) of hazardous waste and/or hazardous constituents from newly and/or previously-identified SWMUs/AOCs pursuant to 73 through 85 of this Order, or to address long-term monitoring results, Modine shall submit a CMS Report to the Department and EPA according to the schedule contained in the approved CMS Work Plan. The CMS Report shall present all information gathered under the approved CMS Work Plan and shall be consistent with guidance contained in the most recent version of the EPA document entitled, RCRA Corrective Action Plan; OSWER Directive 9902.3-2A May 1994. The CMS Report shall summarize the results of the investigations for each remedy studied and of any bench-scale or pilot tests conducted. The CMS Report shall include, but not be limited to, the following information:

A. Evaluation of performance, reliability, ease of implementation, and potential impacts of each remedy studied, including safety impacts, cross media impacts, and control of exposure to any residual contamination;

B. Assessment of the effectiveness of each remedy in achieving adequate control of sources and cleanup of the hazardous waste or hazardous constituents released from the SWMU(s)/AOC(s);

C. Assessment of the time required to begin and complete each remedy;

D. Estimation of the costs of implementing each remedy;

E. Recommendation of remedy and rationale for selection; and

F. Assessment of institutional requirements, such as state or local Permit requirements, or other environmental or public health requirements which may substantially affect implementation of the remedy.

87. The CMS Final Report shall contain adequate information to support the Department in the remedy approval decision-making process.

88. The CMS Final Report will be reviewed in accordance with the procedures set forth in Section VII (Review and Approval Procedures).

Final Remedy Selection

89. If the Department determines that corrective measures are necessary to address a release(s) of hazardous waste and/or hazardous constituents from newly and/or previously-identified SWMUs/AOCs pursuant to paragraphs 73 through 85 of this Order, the Department will approve a final remedy that will: 1) be protective of human health and the environment; 2) control and/or eliminate the source(s) of contaminants so as to reduce or eliminate, to the maximum extent practicable, further contaminant releases, exposures, or migration that might pose a threat to human health and the environment; and 3) meet all applicable federal, state, and local laws and regulations.

90. If the Department determines that corrective measures are necessary and a final remedy is selected pursuant to paragraph 89 of this Order, the Department and Modine agree to enter into negotiations for a second Abatement Order on Consent to include the Corrective Measures Implementation Work Plan, implementation of the selected Corrective Measures, Corrective Measures Implementation Report, and Certification of Completion of Corrective Measures.

Quarterly Progress Reports

91. Modine shall submit to the Department and EPA signed Quarterly Progress Reports summarizing all corrective action activities undertaken during each calendar quarter. Each Quarterly Progress Report shall be due within 60 days following the last day of each reporting period (i.e., March 1, June 1, September 1, and December 1).

92. The first Quarterly Progress Report shall be due within 60 days of the end of the calendar quarter in which this Order becomes effective. The Quarterly Progress Reports shall continue to be submitted until such time as Modine's corrective action work activities are complete. The Quarterly Progress Reports shall include the following information for the time period being reported:

A. A description of the work completed;

B. Summaries of all findings, including summaries of laboratory data;

C. Summaries of all problems or potential problems encountered during the reporting period and actions taken to rectify problems;

D. Projected work for the next reporting period; and

E. Any instances of noncompliance with the corrective action work

requirements of this Order not required to be reported elsewhere in this Order.

93. Detailed technical information shall be submitted as part of the Interim Measures, RFI, CMS, and/or other reports required by this Order. This detailed information need not be reproduced as part of the Modine's Quarterly Progress Reports.

94. Copies of other reports (e.g., inspection reports), information, or data shall be made available to the Department and EPA upon request.

Supplemental Data

95. All raw data, such as laboratory reports, drilling logs, bench-scale or pilot-scale data, and other supporting information gathered or generated during activities undertaken pursuant to this Order shall be maintained by Modine during the term of this Order.

SECTION VII. - REVIEW AND APPROVAL PROCEDURES

96. Following submission of any plan or report pertaining to this Order, (with the exception of Quarterly Progress Reports) the Department will review and either approve or disapprove the plan or report in writing.

97. If the Department does not approve the plan or report, the Department will notify Modine in writing of the plan's or report's deficiencies Modine shall submit a revised plan or report within 30 days of the date it receives the notification.

98. If the Department does not approve the revised plan or report, the Department may modify the plan or report and notify Modine of the modifications. The plan or report as modified by the Department shall be the approved plan or report.

99. If Modine disagrees with any Departmental plan or report modifications and if any dispute cannot be resolved informally, the dispute of the Departmental modifications shall be handled pursuant to Section XVI (Dispute Resolution) of this Order.

SECTION VIII. - ADDITIONAL WORK

100. The Department may determine that certain tasks, including investigatory work, engineering evaluation, or procedure/methodology modifications are necessary in addition to, or in lieu of tasks included in any Department-approved Work Plan, when such additional work is necessary to protect human health or the environment. If the Department determines that additional work is necessary, the Department will notify Modine in writing as to the nature of the additional work and the basis for its determination. Within thirty (30) days after the receipt of such notice, Modine will have

the opportunity to meet with the Department to discuss the additional work. If the Parties reach an agreement, said agreement shall be memorialized in writing and shall be a modification of this Order pursuant to paragraph 141. If required by the Department, Modine shall submit to the Department for review and approval a Work Plan for any such additional work. Such Work Plan shall be submitted in accordance with the time frame specified in the notification letter, unless a longer period of time has been agreed to in writing by the parties. All additional work performed by Modine pursuant to this paragraph shall be performed in a manner consistent with this Order and any applicable provisions of such approved Work Plans.

If the Parties are unable to reach agreement, either Party may invoke the provisions of Section XVI (Dispute Resolution).

SECTION IX. QUALITY ASSURANCE

101. Throughout all sample collection and analysis activities, Modine shall use EPA-approved quality assurance, quality control, and chain-of-custody procedures as specified in approved Work Plans. In addition, Modine shall:

A. Ensure that laboratories used by Modine for analysis perform such analyses according to the EPA methods included in the most current version of Test Methods for Evaluating Solid Waste (SW-846) or other methods deemed satisfactory by the Department. If methods other than EPA approved methods are to be used, Modine shall submit all protocols to be used for analysis to the Department for approval as part of the RFI, CMS, and other Work Plans.

B. Ensure that laboratories used by Modine for analysis participate in a quality assurance/quality control program equivalent to that followed by MDNR-Environmental Services Program (ESP). As part of such a program, and upon request by the Department, such laboratories shall perform analyses of samples provided by MDNR-ESP to demonstrate the quality of the analytical data.

C. Inform the Department's Project Coordinator at least fifteen (15) days in advance of sampling which laboratories will be used by Modine.

SECTION X. - SAMPLING

102. All results of sampling, tests, modeling or other data (including un-interpreted data) generated by Modine, or on Modine's behalf, during implementation of this Order, shall be submitted to the Department after sampling, tests, modeling or other data have been verified by Modine's quality assurance/quality control procedures. The Department will provide Modine with copies of all MDNR generated sampling, tests,

modeling, and other data (including un-interpreted data) covered under this Order.

103. Modine will orally notify the Department at least fifteen (15) days prior to conducting field events as described in the work plans submitted pursuant to this Order. At the Department's oral or written request, or at the request of the Department's authorized representative, Modine shall allow the Department, or its authorized representatives, to split or duplicate samples which are collected by Modine in implementing this Order.

SECTION XI. - ACCESS

104. The Department and its authorized representatives shall have access to the Facility for the purpose of reviewing Modine's progress in carrying out the provisions of this Order, including, but not limited to, inspecting and copying records, collecting samples, and verifying data.

105. To the extent that work required by this Order must be performed on property not owned or controlled by Modine, Modine shall write to the property owner requesting access to the property. The request shall be sent by certified mail, return receipt requested, with a copy to the Department. Modine shall obtain site access agreements from the owners of such property prior to work plan approval for off-site work for which site access is required..

106. Modine shall use its best efforts to gain access for off-site work. "Best Efforts" shall include sending the letter described above in paragrah 105 and agreeing, upon written request, to provide splits or duplicates of all samples collected on the property and results of all analyses of samples collected on the property.

107. In the event that such access agreements are not obtained prior to approval of any plans for which offsite access is required, Modine shall notify the Department in writing, within fifteen (15) days of such failure. Modine shall indicate both the lack of agreement and the efforts made to obtain access. The Department may, as it deems appropriate, assist Modine in obtaining access. In the event that the Department obtains access, Modine shall undertake the Department-approved work required by this Order on such property. Nothing in this Order shall limit or otherwise affect the Department's rights of access and entry.

In the event Modine's best efforts fail to result in an executed access agreement, Modine shall on an annual basis, contact the property owner who has previously refused access and attempt to acquire access as set out above in paragraphs 105 and 106.

SECTION XII. - RECORD PRESERVATION

108. All records and documents in Modine's possession that relate in any way to

the site shall be preserved during the conduct of this Order for a minimum of three (3) years after commencement of any corrective action work or investigation. Modine shall acquire and retain copies of all documents that relate to the site and which are in the possession of its employees, agents and contractors. After this three (3) year period, Modine shall notify the Department at least sixty (60) days before the documents are scheduled to be destroyed. Modine shall make those documents available to the Department if requested within the sixty (60) day period.

109. In accordance with Section 260.430 and 260.550 RSMo., information shall be available to the public unless nondisclosure is requested in writing including justification to the satisfaction of the Director that such information constitutes trade secrets or information which is entitled to confidential treatment in order to protect any plan, process, tool, mechanism or compound which is known only to the person claiming confidential treatment and where confidential treatment is necessary to protect such person's trade, business or manufacturing process, where such nondisclosure will not result in an unreasonable threat to the health of humans or other living organisms and disclosure is not required under any federal hazardous waste management act. If the Director finds the information does not warrant confidential treatment, the person shall be notified by registered mail. The information may be released to the public after thirty days of receipt of the notice from the Director unless Modine obtains a restraining order prohibiting disclosure. Any action by the Director concerning confidential treatment may be appealed to the Hazardous Waste Management Commission pursuant to Section 260.430, RSMo and Section 260.415 RSMo.

SECTION XIII. - PROJECT COORDINATOR

110. The Department designates Christine Kump (whose address and telephone number appear in Section XIV (Submissions/Notification) of this Order and EPA designates Bill Pedicino (whose address and telephone number also appear in Section XIV (Submissions/Notification) of this order) as their respective Project Coordinators.

111. All work performed pursuant to this Order shall be under the direction and supervision of a Project Coordinator appointed by Modine who shall be qualified to supervise the activities to be performed hereunder. Prior to the initiation of the work at the Facility, Modine shall notify the Department in writing of the name, title, and qualifications of the Project Coordinator and of any known contractors and/or subcontractors to be used in carrying out the terms of this Order. The Department, EPA, and Respondent shall each have the right to change their respective Project Coordinator. Modine shall provide at least fifteen (15) days written notice to the Department prior to changing its Project Coordinator. The Department and EPA will provide Modine with written notice upon any change in their designated Project Coordinators.

112. To the maximum extent practicable, all communications between Modine and the Department shall be directed between the Project Coordinators. The absence of the Department's Project Coordinator from the Facility shall not be cause for stoppage of

work.

SECTION XIV. - SUBMISSIONS/NOTIFICATION

113. Unless otherwise specified by the Department, two (2) copies of all written reports, correspondence, approvals, disapprovals, notices or other submissions relating to or required under this Order shall be sent to:

Project Coordinator
Hazardous Waste Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, Missouri 65102
(573) 751-3553

or (for parcel delivery)

1738 East Elm
(Lower Level)
Jefferson City, Missouri 65101

114. One (1) copy of all written reports, correspondence, approvals, disapprovals, notices or other submissions relating to or required under this Order shall be sent to:

Project Coordinator
RCRA Corrective Action and Permitting
U.S. Environmental Protection Agency, Region VII
901 N. 5th St.
Kansas City, Kansas 66101
(913) 551-7000

SECTION XV. - RESERVATION OF RIGHTS

115. Nothing in this Order shall constitute or be construed as a release from any claim, cause of action, or demand in law or equity against any person, firm, partnership, or corporation for any liability it may have arising out of or relating in any way to the handling or release of any hazardous waste and/or hazardous constituent found at, taken to, or taken from the Facility.

116. Notwithstanding compliance with the terms of this Order, the Department and EPA reserve the right to take further action as necessary to respond under the Missouri Hazardous Waste Management Law (Section 260.350, et seq. RSMo.), RCRA, CERCLA, or other statutory authority with respect to any conditions or releases at the Facility. The Department and EPA expressly reserve all rights that they may have to

require that Modine perform tasks in addition to those detailed in this Order.

117. The Department and EPA reserve the right to take any enforcement action pursuant to Missouri Hazardous Waste Management Law (Section 260.350, et seq. RSMo.), RCRA, CERCLA, or other statutory authority or to seek other injunctive relief, monetary penalties, and punitive damages for any violation of law or this Order.

SECTION XVI. - DISPUTE RESOLUTION

118. This section shall apply to any dispute, disapproval, modification, determination, or other decision or directive made by the Department pursuant to this Order.

119. If Modine disagrees with any disapproval, modification, determination, or other decision or directive made by the Department pursuant to this Order, Modine shall notify the Department in writing of its objections and the bases therefor within thirty (30) days of receipt of such disapproval, modification, determination, decision, or directive. This notice shall set forth the specific points of the dispute, the position Modine maintains should be adopted as consistent with the requirements of this Order, the factual and legal bases for Modine's position, and all matters Modine considers necessary for the Department to make a determination.

120. Modine and the Department shall have thirty (30) days from the Department's receipt of Modine's objections to attempt to informally resolve the dispute. Both parties may agree in writing to an extension of the thirty (30) day time period set forth above. If an agreement is reached on the issue in dispute, the resolution shall be reduced to writing, signed by representatives of each party and incorporated into this Order. If the parties are unable to reach agreement within time for informal negations, the parties will submit their positions to the Hazardous Waste Management Commission, whose decision shall be binding on the parties and whose decision shall be incorporated into this Order.

SECTION XVII. - FORCE MAJEURE

121. For purposes of this Order, "force majeure" means a strike or an act of God, war, riot or other catastrophe.

122. In the event that a force majeure event should arise, Modine shall use its best efforts to avoid a delay. The requirement that Modine exercise "best efforts to avoid the delay" includes using best efforts to anticipate any potential force majeure event and best efforts to address the effects of any potential force majeure event (1) as it is occurring and (2) following the potential force majeure event such that the delay is minimized to the greatest extent practicable. Examples of events that are not force majeure events include, but are not limited to, increased cost or expenses of any work to be performed

under this Order or the financial difficulty of Modine to perform such work.

If any event occurs or has occurred that is likely to delay the performance of an obligation under this Order, whether or not caused by a force majeure event, Modine shall notify the Department by telephone within forty-eight (48) hours if Modine knows that the event is likely to cause a delay. Within seven (7) calendar days thereafter, Modine shall provide in writing the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to mitigate the effect of the delay; and a statement as to whether, in the opinion of Modine, such event may cause to contribute to an endangerment to the public health, public welfare or the environment. Failure to comply with the above requirements shall preclude Modine from asserting any claim of force majeure.

123. If the Department agrees that the delay or anticipated delay is attributable to a force majeure event, the time for performance of any obligation under this Order that is directly affected by the force majeure event shall be extended by written agreement of the parties, pursuant to Section XXIII (Effective Date and Subsequent Modification) of this Order, for a period of time not to exceed the actual duration of the delay caused by the force majeure event. An extension of time for performance of the obligation directly affected by the force majeure event shall not, of itself, extend the time for performance of any subsequent obligation.

124. If the Department does not agree that the delay or anticipated delay has been, or will be caused by a force majeure event, or does not agree with Modine on the length of the extension, the issue shall be subject to the Dispute Resolution procedures set forth in Section XVI (Dispute Resolution) and Section VII (Review and Approval Procedures) of this Order. In any such proceeding, to qualify for a force majeure defense, Modine shall have the burden of demonstrating by a preponderance of the evidence that the delay or anticipated delay has been or will be caused by a force majeure event, that the duration of the delay was or will be warranted under the circumstances, and that Modine exercised or is exercising due diligence by using its best efforts to avoid and mitigate the effects of the delay.

125. Should Modine carry the burden set forth in the previous paragraph, the delay at issue shall be deemed not to be a violation of the affected obligation of this Order.

SECTION XVIII. - DELAY IN PERFORMANCE/STIPULATED PENALTIES

126. Failure to comply with this Order within the times specified herein will result in the Department initiating court action for injunctive relief, assessment of penalties not to exceed ten thousand dollars ($10,000.00) per day for each day or part thereof noncompliance, and any other applicable remedy pursuant to Section 260.425, RSMo. Compliance with this Order does not preclude the Department from pursuing penalties for

failure to perform the corrective action activities outlined in this Order. The Department may, in its sole, non-reviewable discretion, waive, suspend or reduce the amount of any stipulated penalties, or the accrual of such penalties, due under this Section based on equitable considerations. The Department will not pursue civil penalties pursuant to Section 260.425, RSMo, if it has already assessed and received from Modine a stipulated penalty pursuant to this Section of the Order for the same violation, or if Modine is proceeding in accordance with paragraph 132.

127. Requests for extensions to the time frames within this Order will be considered and may be granted, on a case-by-case basis.

128. Unless there has been a written modification of a compliance date signed by the Department, a written modification signed by the Department of an approved work plan condition, or a force majeure event as defined in Section XVII, Force Majeure, or a pending dispute resolution pursuant to Section XVI, if Modine fails to comply with the terms and conditions set forth in this Order in the time and manner specified herein, Modine shall pay stipulated penalties according to the following schedule if Modine fails to comply, with compliance dates listed in Section VI (Work to be Performed) of this Order. The penalties set forth below are per day penalties which are to be assessed beginning with the first day of noncompliance after the scheduled deadline date in Section VI (Work to be Performed) of this Order.

PERIOD OF NONCOMPLIANCE	**PENALTY PER VIOLATION**
First through 30th day of noncompliance	-0-
31st through 60th day of noncompliance	$500.00
61st through 90th day of noncompliance	$1,000.00
Beyond 91st day of noncompliance	$1,500.00

129. Where a month rather than a specific date is set forth in the Order, the compliance date, for purposes of calculating the stipulated penalties listed in this Section, shall be the last day of the month. Accordingly, the first day of noncompliance, for the purposes of calculating the stipulated penalties, shall be the first day of the following month.

130. The stipulated penalties set forth in this Section shall apply only to the schedules addressed in Section VI (Work to be Performed) of this Order. No penalties shall apply to any claims by the Department that the reports called for in the Order are inadequate, insufficient or incomplete. If the Department believes that there are any deficiencies or inaccuracies in the required reports, the procedures set forth in Section XVI (Dispute Resolution) of this Order shall govern the dispute.

131. All penalties set forth in this Section shall begin to accrue from the date of noncompliance and shall continue to accrue through the final day of noncompliance unless

otherwise determined not to accrue pursuant to other provisions contained in this Order.

132. The Department will provide Modine with written notification of any alleged non-compliance as soon as practicable after discovery. Said notice will specify the basis for the alleged non-compliance and any penalty allegedly accrued to date. All penalties owed under this Section of this Order shall be payable within sixty (60) days of receipt of the notification of noncompliance unless the penalty is challenged by Modine pursuant to the Dispute Resolution procedure outlined in Section XVI (Dispute Resolution). If the penalty is challenged, it shall not be paid until thirty (30) days after the Director's determination that Modine owes the stipulated penalty, and Modine has failed to use, or has exhausted, its rights to review the Director's decision.

133. Stipulated penalties shall continue to accrue during the formal Dispute Resolution process or any appeal. In the event Modine prevails, stipulated penalties shall not be due or owed. The Department may, in its sole, discretion, waive, suspend or reduce the amount of any stipulated penalties, or the accrual of such penalties, due under this Section based on equitable considerations.

134. All payments accruing under this Section shall be made by certified check made payable to the Camden County Treasurer as Trustee for the Camden County School Fund and delivered to the Attorney General of Missouri, P.O. Box 899, Jefferson City, Missouri 65102-0899, Attention Shelley Woods, Assistant Attorney General, or designee.

SECTION XIX. --NON-ADMISSION OF LIABILITY

135. The Parties agree that the actions undertaken by the Respondent in accordance with this Order do not constitute an admission of liability by Modine. Modine agrees to comply with and be bound by the terms of this Order. However, Respondent does not admit, and retains the right to controvert in any subsequent proceedings, other than proceeding to implement or enforce this Order, the validity of the Findings of Fact, Conclusions of Law and Determinations set forth in this Order.

SECTION XX. - OTHER APPLICABLE LAWS

136. All actions required to be taken pursuant to this Order shall be undertaken in accordance with the requirements of all applicable federal, state, and local laws and regulations. Modine shall be responsible for obtaining all federal, state or local permits necessary for the performance of the work described herein.

SECTION XXI. - SEVERABILITY

137. If any provision or authority of this Order or the application of this Order to any party or circumstances is held by any judicial or administrative authority to be invalid, the application of such provision to other parties or circumstances and the

remainder of the Order shall remain in full force and shall not be affected thereby.

SECTION XXII. - INDEMNIFICATION OF THE STATE OF MISSOURI

138. Modine agrees to indemnify the state of Missouri and to hold the State, its agencies, departments, agents and employees harmless from any and all claims or causes of action arising from or on account of acts or omissions of Modine, its employees, agents, servants, receivers, successors, assigns or subsidiaries in carrying out activities under the Order. The State or any agency or authorized representative thereof shall not be held as a party to any contract entered into by Modine in carrying out activities under this Order. Similarly, Modine or its agents, contractors, employees, successors and assigns shall not be held out as a party to any contract entered into by the State. This indemnification provision does not apply to any persons not a party to this Order.

SECTION XXIII. - EFFECTIVE DATE AND SUBSEQUENT MODIFICATION

139. The effective date of this Order shall be the date upon which the fully-executed Order is received by Modine.

140. All time lines for performance and compliance begin to run from the effective date of this Order.

141. This Order may be amended by mutual agreement of the Department and Modine. Any such amendments shall be in writing and shall be effective when such fully-executed amendments are received by Modine. The Department's Project Coordinator shall be authorized to extend in writing any date, deadline, or schedule contained in any Department-approved work plan.

142. No informal advice, guidance, suggestions or comments by the Department regarding reports, plans, specifications, schedules or any other writing submitted by Modine shall be construed as relieving Modine of its obligations to obtain such formal approval as may be required by this Order.

SECTION XXIV. - TERMINATION

143. The provisions of this Order shall be deemed satisfied by Modine on written notice from the Department that Modine has demonstrated that all of the terms of this Order including any additional work as may be performed pursuant to Section VIII (Additional Work) of this Order, have been completed to the satisfaction of the Department.

144. Termination of this Order shall not, however, terminate Modine's obligation to comply with Sections XII (Record Preservation) and XV (Reservation of Rights), of this Order.

SECTION XXV. - GENERAL SITE MAPS

Figures 1 and 2 are attached as Appendix A.

SECTION XXVI. - SIGNATURE

DEPARTMENT OF NATURAL RESOURCES

[Original signed by John A. Young]

August 9, 1999
Date

John A. Young, Director
Division of Environmental Quality

[Original signed by Shelley A. Woods]

July 16, 1999
Date

JEREMIAH W. ("JAY") NIXON
ATTORNEY GENERAL

Shelley A. Woods
Assistant Attorney General

MODINE MANUFACTURING COMPANY

[Original signed by Gary A. Fahl]

7/12/99
Date

Gary A. Fahl
Environmental Health and Safety Officer

State of Missouri
Department of Natural Resources

In the matter of:	)	**Administrative Settlement and**
	)	**Abatement Order on Consent**
Former Hulett Lagoon Site,	)	**for Supplemental Remedial**
Camdenton, Missouri	)	**Investigation and Feasibility**
	)	**Study**
Hamilton Sundstrand Corporation, a	)	
subsidiary of United Technologies	)	
Corporation	)	
	)	Proceeding under Sections 107
	)	and 122 of the Comprehensive
Modine Manufacturing Company,	)	Environmental Response,
	)	Compensation, and Liability Act,
and	)	as amended, 42 U.S.C. §§ 9607,
	)	and 9622, and § 260.530
	)	
City of Camdenton,	)	
	)	
Respondents	)	

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I. JURISDICTION AND GENERAL PROVISIONS

1. This Abatement Order on Consent ("Order") as defined in Section IV, is entered into by the Missouri Department of Natural Resources ("MDNR") and Hamilton Sundstrand Corporation ("Hamilton"), a subsidiary of United Technologies Corporation, Modine Manufacturing Company ("Modine"), and the City of Camdenton ("Respondents"). This Order pertains to the Former Hulett Lagoon Site.

2. The Former Hulett Lagoon Site, as depicted in Figure 1 attached hereto, is defined in paragraph 13.f. and includes the Hulett Lagoon Facility and Sunset Drive Facility for the purposes of Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

3. The Hulett Lagoon Facility is defined in paragraph 13.j.

4. This Order requires the Respondents to conduct a Supplemental Remedial Investigation Feasibility Study in furtherance of the objectives set forth at 40 C.F.R. 300.430 of the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300 ("NCP"). It further requires the Respondents to reimburse all unreimbursed Past Response Costs and Future Response Costs incurred by MDNR in overseeing this action.

5. This Order is issued pursuant to § 260.530 RSMo, and pursuant to the authority provided to the states under § 107 of CERCLA, 42 U.S.C. § 9607. For purposes of entering into this Order, Respondents agree that MDNR has jurisdiction to issue this Order and jurisdiction over the activities required by this Order. Respondents' participation in this Order shall not constitute or be construed as an admission of liability or of the findings or determinations contained in this Order. Respondents agree to comply with and be bound by the terms of this Order. Respondents consent to and agree not to contest MDNR's authority or jurisdiction to issue or to enforce this Order. Respondents further agree not to contest the basis or validity of this Order or any of its terms.

II. PARTIES BOUND

6. This Order applies to and is binding upon MDNR and upon the Respondents and Respondents' successors and assigns, trustees and receivers and anyone acting under or on behalf of Respondents. The signatories to this Order certify that they are authorized to execute and legally bind the parties that they represent to this Order.

7. Respondents shall be responsible for and liable for any failure to carry out any activities required by Respondents pursuant to this Order, regardless of Respondents' use of employees, agents, contractors or consultants to perform such tasks.

8. No change in ownership or corporate or partnership status relating to the Hulett Lagoon Facility or Sunset Drive Facility shall in any way alter Respondents' responsibility under this Order. Respondents shall give written notice of this Order to any successor in interest prior to transfer of ownership or operation of either facility (or any portion thereof) and shall notify MDNR in writing thirty (30) days prior to such transfer. Respondents shall include, as a condition in any such transfer, that Respondents have a right of access to the Former Hulett Lagoon Site in order to conduct the Work required under this Order.

9. Respondents shall provide a copy of this Order to its contractors, subcontractors, laboratories, consultants and other representatives retained to conduct any work performed under this Order within ten (10) working days of the effective date of this Order or the date of retaining their services, whichever is later. Respondents shall condition any such contracts for work to be performed under this Order upon satisfactory compliance with this Order to the extent it is applicable to the work to be performed by such person. Respondents shall be responsible for any noncompliance with this Order and are responsible for ensuring that their contractors, subcontractors, laboratories, consultants, and other representatives comply with this Order to the extent that it is applicable to work to be performed by such persons.

III. STATEMENT OF PURPOSE

10. This Order concerns the Former Hulett Lagoon Site.

11. By entering into this Order, the mutual objectives of the Parties are: (a) to determine the nature and extent of contamination caused by the actual or threatened releases of Hazardous Substances, pollutants or contaminants at or from the Former Hulett Lagoon Site, and/or the past or present handling, storage, treatment, transportation, or deposition by Respondents, or their predecessors, of any solid wastes or Hazardous Substances at or from the Former Hulett Lagoon Site by conducting a remedial investigation; (b) to identify and evaluate alternatives for remedial actions, if any, necessary to prevent, mitigate or otherwise respond to or remedy any release or threatened release of Hazardous Substances, pollutants or contaminants or solid wastes at or from the Former Hulett Lagoon Site by conducting a feasibility study;

and (c) to reimburse past and future response and oversight costs incurred by MDNR as set forth in this Order.

12. The activities conducted under this Order are subject to approval by MDNR and shall provide all appropriate necessary information for the Supplemental RI/FS (defined in Section IV) that is consistent with CERCLA and the NCP, 40 C.F.R. Part 300. The activities conducted under this Order shall be conducted in compliance with all applicable state laws and regulations, and all applicable state and EPA guidance, policies, and procedures.

IV. DEFINITIONS

13. Unless otherwise expressly provided herein, terms used in this Order which are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in said statutes or their implementing regulations. Whenever terms listed below are used in this Order or in the exhibits or appendices attached hereto and incorporated hereunder, the following definitions shall apply:

    a. "CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601, et seq.

    b. "Day" shall mean a calendar day unless expressly stated to be a working day. "Working day" or "business day" shall mean a day other than a Saturday, Sunday, or federal or state holiday. In computing any period of time under this Order, where the last day would fall on a Saturday, Sunday, or federal or state holiday, the period shall run until the close of business of the next working day.

    c. "Effective Date" shall mean the date this Order is effective, pursuant to Section XXIV of this Order.

    d. "EPA" shall mean the United States Environmental Protection Agency and any successor departments or agencies of the United States.

    e. "Feasibility Study" or "FS" shall mean a study undertaken to identify and evaluate alternatives for remedial action.

f. "Former Hulett Lagoon Site" or "Site" shall mean the Hulett Lagoon Facility, the Sunset Drive Facility, and any location damaged or injured as a result of releases or threatened releases of Hazardous Substances from either the Hulett Lagoon Facility or the Sunset Drive Facility and where such Hazardous Substances have become known to be located.

g. "Future Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs that the State of Missouri incurs on or after January 1, 2015, in reviewing or developing plans, reports, and other items pursuant to this Order; compliance monitoring including the collection and analysis of samples, inspection of activities, and visits to the Former Hulett Lagoon Site; public outreach activities; verifying the Work; or otherwise implementing, overseeing, or enforcing this Order (including, but not limited to attorney's fees and any monies paid to secure access and/or to secure institutional controls, including the amount of just compensation).

h. "Hazardous Substances" shall have the same meaning as in Section 101(14) of CERCLA, 42 U.S.C. § 9604(14).

i. "Hazardous Substance Superfund" shall mean the Hazardous Substance Superfund established by the Internal Revenue Code, 26 U.S.C. § 9507.

j. "Hulett Lagoon Facility" shall mean the publicly-owned treatment works operated by the City of Camdenton from 1961 through 1989, pursuant to a Missouri State Operating Permit held by the City and the areas surrounding the Hulett Lagoon that have been damaged or injured as a result of releases or threatened releases of Hazardous Substances, which is currently owned and operated by the City of Camdenton.

k. "Interest" shall mean interest at the current rate specified for interest on investments of the Hazardous Substance Superfund, compounded annually on October 1 of each year, in accordance with 42 U.S.C. § 9607(a).

l. "Matters Addressed" shall mean all Work performed and all payments made pursuant to this Order.

m. "MDHSS" shall mean the Missouri Department of Health and Senior Services and any successor departments or agencies of the State.

n. "MDNR" shall mean the Missouri Department of Natural Resources and any successor departments or agencies of the State.

o. "National Contingency Plan" or "NCP" shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, including, but not limited to, any amendments thereto.

p. "Order" shall mean this Administrative Settlement and Abatement Order on Consent and all appendices attached hereto or incorporated by reference. In the event of a conflict between this Order and any appendix, the Order shall control.

q. "Paragraph" shall mean a portion of this Order identified by an Arabic numeral or an upper or lower case letter.

r. "Parties" shall mean the State of Missouri and the Respondents.

s. "Past Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the State of Missouri paid at or in connection with the Former Hulett Lagoon Site on or after December 31, 2009, through December 31, 2014. Notwithstanding the foregoing, "Past Response Costs" shall not include any costs arising out of the RCRA Corrective Action conducted at the Sunset Drive Facility.

t. "Performance Standards" shall mean the cleanup standards and other measures of achievement of the goals of this Order as set forth in this Order and any modified standards established by MDNR.

u. "RCRA" shall mean the Solid Waste Disposal Act, as amended, 42 U.S.C. §§ 6901 et seq. (also known as the Resource Conservation and Recovery Act).

v. "Remedial Investigation" or "RI" shall mean a process undertaken to

determine the nature and extent of the contamination caused by releases of Hazardous Substances, pollutants or contaminants. The Remedial Investigation includes sampling and monitoring, as necessary, and includes the gathering of sufficient information to determine the necessity for remedial action and to support the evaluation of remedial action alternatives.

w. "Respondents" shall mean Hamilton Sundstrand Corporation, a subsidiary of United Technologies Corporation, Modine Manufacturing Company, the City of Camdenton, and all of their successors and assigns.

x. "RI/FS" shall mean Remedial Investigation/Feasibility Study.

y. "Section" shall mean a portion of this Order identified by a Roman numeral.

z. "State" shall mean the State of Missouri.

aa. "Statement of Work" or "SOW" shall mean the Statement of Work for implementation of the Supplemental RI/FS, as set forth in Appendix 1 to this Order, and any modifications made thereto in accordance with this Order.

bb. "Supplemental RI/FS" shall mean all activities to be conducted for the completion of the Supplemental Remedial Investigation/Feasibility Study for the Former Hulett Lagoon Site.

cc. "Sunset Drive Facility" shall mean the metals manufacturing facility located at 179 Sunset Dr., Camdenton, Missouri that discharged Hazardous Substances to the Hulett Lagoon Facility from 1967 to 1990 and discharged Hazardous Substances to groundwater.

dd. "United States" shall mean the United States of America, including all of its departments, agencies and instrumentalities.

ee. "Work" shall mean all work and other activities Respondents are required to perform under this Order.

V. FINDINGS OF FACT

Former Hulett Lagoon Site Background

14. This Order pertains to the Former Hulett Lagoon Site.

15. The Hulett Lagoon Facility was constructed of clay with berms approximately twenty-five feet wide and fifteen-feet high. The Hulett Lagoon Facility received both industrial and residential wastewater until the City of Camdenton closed it in 1989.

16. Hamilton or its predecessor operated the Sunset Drive Facility until 1990. Modine purchased the Sunset Drive Facility in August 1990 and continued manufacturing at the Sunset Drive Facility until its closure in 2012.

17. The Sunset Drive Facility began discharging untreated wastewater to the Hulett Lagoon Facility in 1967.

18. From 1967 to 1989, the Hulett Lagoon Facility received storm water and untreated wastewater containing a number of Hazardous Substances associated with Hamilton's manufacturing operations, including trichloroethylene ("TCE") and other volatile organic compounds.

19. MDNR alleges that Hazardous Substances have been disposed or released at the Former Hulett Lagoon Site.

20. MDNR alleges that the conditions at or associated with the Former Hulett Lagoon Site constitute a "hazardous substance emergency" as that term is defined in § 260.500(6) RSMo.

21. MDNR has the authority to: (1) require reasonable actions to clean up Hazardous Substances; (2) investigate and clean up releases associated with the Former Hulett Lagoon Site; (3) recover all response costs not inconsistent with the NCP; (4) recover natural resource damages resulting from the releases or threatened releases of Hazardous Substances from the Former Hulett Lagoon Site; and (5) enter into agreements with respect to the elimination of alleged violations of environmental laws and the cleanup of real property contaminated by Hazardous Substances. The Missouri Attorney General has the

authority to bring an action to abate any public nuisance present at a site.

22. Respondents have taken the following actions at the Former Hulett Lagoon Site:

a. In April 1986, the Sunset Drive Facility's wastewater pre-treatment infrastructure became operational.

b. After the City of Camdenton constructed a new publicly-owned treatment works in 1986, the Sunset Drive Facility was connected to the new treatment plant.

c. In 1989, the City of Camdenton closed the Hulett Lagoon Facility with the approval and oversight of MDNR.

d. In February 1997, the City of Camdenton discovered TCE in its Mulberry Street municipal water supply well ("Mulberry Well").

e. The City of Camdenton responded to the discovery of TCE in the Mulberry Well by instituting a groundwater containment system (the "Containment System") that involved the discontinuation of the Mulberry Well as a municipal water supply. The City of Camdenton pumped the TCE-contaminated groundwater from the Mulberry Well and discharged it to waste through a ravine which eventually discharged to the Lake of the Ozarks. The discharged water is regulated pursuant to a Missouri State Operating Permit issued by MDNR. The City of Camdenton continues to operate the Containment System as a means of hydraulic control, preventing the spread of groundwater contamination.

f. In July 1999, MDNR and Modine entered into an Abatement Order on Consent, wherein Modine agreed to perform certain work to further characterize the extent of soil contamination on certain real property owned by Modine. The investigation resulted in approximately 10,400 cubic yards of contaminated soil being excavated and disposed as a special waste at an area landfill.

g. In 2000, Hamilton entered into a voluntary letter of agreement with MDNR's Hazardous Waste Program to enter the Superfund Section's State Cooperative Program to conduct an RI/FS with

MDNR oversight to investigate groundwater contamination caused by historic releases of TCE and other volatile organic compounds at the Former Hulett Lagoon Site, and to evaluate remedial action alternatives.

h. Hamilton completed three Remedial Investigation phases from 2000 to 2003 and summarized findings in the RI Summary Report, November 24, 2003, submitted to the MDNR.

i. Hamilton submitted a Feasibility Study to the MDNR on October 18, 2004. MDNR conditionally approved Hamilton's Feasibility Study on July 27, 2005.

j. The Hamilton Feasibility Study included (by appendix) a Groundwater Flow Model Report dated September 10, 2004.

k. The Hamilton Feasibility Study also included (by appendix) a Target Risk Assessment, consisting of a Baseline Human Health Risk Assessment, and a Qualitative Screening Level Ecological Risk Assessment.

l. After requesting additional investigation that was later completed by Hamilton, MDNR approved Hamilton's Notice of Intent to Implement Final Remedial Investigation Activities for Camdenton, MO by letter dated July 30, 2007. An Investigation Addendum Report was submitted to MDNR in April 2008.

m. On November 5, 2007, at the request of MDNR, as part of the overall Remedial Action for the groundwater and subsurface soils affected by releases of TCE and other volatile organic compounds at the Former Hulett Lagoon Site, Hamilton properly abandoned a private drinking water well at the Bruneau residence, at its sole cost and expense.

n. Respondents do not admit any liability to the State arising out of the transactions or occurrences alleged herein, nor do Respondents acknowledge that the releases or threatened releases of Hazardous Substances at or from the Former Hulett Lagoon Site constitute an imminent or substantial endangerment to the public health or welfare or the environment.

o. Based on the information presently available to the State, the State believes that the Work outlined in this Order and the Statement of Work (hereinafter defined and/or attached hereto as Appendix "A"), as may be amended from time to time, will be properly and promptly conducted by Respondents if conducted in accordance with the requirements of this Order and its appendices.

p. Additionally, for the purposes of Section 113 (j) of CERCLA, the Work performed by Respondents shall constitute a response action taken or ordered by the State.

q. The Parties recognize that this Order has been negotiated by the Parties in good faith, and implementation of this Order will expedite the cleanup of releases at or from the Former Hulett Lagoon Site and will avoid prolonged and complicated litigation between the Parties, and that this Order is fair, reasonable, and in the public interest.

Previous Investigations and Findings

23. The Hulett Lagoon Facility was constructed in 1961 and was operated by the City of Camdenton until its closure was approved by MDNR in 1989. During its operation, the lagoon received both domestic and industrial wastewater and storm runoff from the area.

24. TCE contamination was detected as early as 1994 in the City of Camdenton's Mulberry Well. In 1997 the measured levels of TCE exceeded the Maximum Contaminant Level (MCL) for drinking water. The well was taken off line and the decision made to pump the well periodically to discharge, thereby maintaining hydrologic control of the contamination, preventing the contamination from spreading to other city wells.

25. In 1999 MDNR conducted a soil gas investigation in the area of the Former Hulett Lagoon Site. The investigation was expanded upon in 2000 by Hamilton. The combined investigations did not discover any area that could be considered a contributing source area to the TCE groundwater contamination.

26. Modine conducted an investigation of soil contamination at the Sunset Drive Facility during the period from 1997 to 2000. The investigation

resulted in the excavation and disposal of approximately 10,400 cubic yards of contaminated soil.

27. Hamilton conducted three phases of groundwater investigation in the area of the Former Hulett Lagoon Site during 2000 through 2003, installing a total of 22 monitoring wells. The investigation indicated that shallow and deep groundwater contamination is limited to an approximate area of one (1) square mile.

28. The three phases of investigation by Hamilton lead to the development of a Feasibility Study which indicated a remedy of pumping contaminated groundwater to maintain hydrologic control and treating the water prior to surface drainage.

29. Hamilton conducted supplemental groundwater investigation activities in the area of the Former Hulett Lagoon Site in 2007, installing three (3) additional monitoring wells, resulting in a total of 25 monitoring wells in the area of the Former Hulett Lagoon Site.

30. Additional investigation and evaluation of remedial action alternatives will be conducted under this Order.

VI. CONCLUSIONS OF LAW AND DETERMINATIONS

31. Based on the Findings of Fact set forth above, and the Administrative Record supporting this action, MDNR makes the following Conclusions of Law and Determinations.

    a. The Hulett Lagoon Facility and Sunset Drive Facility are "facilities" as that term is defined by Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

    b. The contaminants found at the Former Hulett Lagoon Site, as set out in the Findings of Fact above, include Hazardous Substances.

    c. The Respondents are "persons" as defined by and within the meaning of Sections 101(21) and 107(a) of CERCLA, 42 U.S.C. §§ 9601(21) and 9607(a), and Section 260.500(7) and (8), RSMo.

    d. The Respondents may be liable under Section 107(a) of CERCLA, 42 U.S.C. § 9607(a) and Section 260.530, RSMo as those terms

are used in Section 107 of CERCLA, 42 U.S.C. § 9607 and Section 260.530, RSMo.

e. The conditions described in the Findings of Fact constitute an actual or threatened "release" of a Hazardous Substance from the Former Hulett Lagoon Site as that term is defined by Section 101(22) of CERCLA, 42 U.S.C. § 9601(22) and Section 260.500(9), RSMo.

f. The actual and/or threatened "releases" of Hazardous Substances from the Former Hulett Lagoon Site may present an imminent and substantial endangerment to the public health, welfare, or the environment within the meaning of Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

g. The Respondents have been, and are currently, in control of handling, storage, treatment, transportation and/or deposition of solid wastes and/or hazardous substances at the Former Hulett Lagoon Site.

h. The conditions described above in the Findings of Fact constitute a "hazardous substance emergency" as that term is defined in Section 260.500(6), RSMo.

i. The actions required by this Order are necessary to protect the public health, welfare or the environment, and are consistent with the NCP and CERCLA.

VII. ORDER

32. Based on the foregoing Findings of Fact, Conclusions of Law, Determinations, and the Administrative Record for this matter, MDNR hereby orders that Respondents shall comply with the following provisions, including but not limited to, all attachments to this Order, and all documents incorporated by reference into this Order, and shall perform the following actions.

Designation of Project Coordinator

33. Respondents shall provide the name, qualifications, and contact information of their selected Project Coordinator to perform the

Supplemental RI/FS, within ten (10) business days after the effective date of this Order.

34. Respondents shall utilize Missouri licensed and/or certified contractors/subcontractors (as applicable) for all Supplemental RI/FS activities.

35. Respondents' Project Coordinator shall be responsible for administration of all of Respondents' actions required by this Order. To the greatest extent possible, Respondents' Project Coordinator shall be present on site or readily available during site work. The MDNR retains the right to disapprove of any Project Coordinator named by the Respondents. If MDNR disapproves of a proposed Project Coordinator, Respondents shall retain a different Project Coordinator and shall notify MDNR of that person's name, address, telephone number, and qualifications within forty-five (45) days following receipt of MDNR's disapproval. Receipt by Respondents' Project Coordinator of any notice or communication from MDNR pertaining to this Order shall constitute receipt by Respondents.

36. The MDNR has designated Don Van Dyke of the MDNR, Division of Environmental Quality (DEQ), Hazardous Waste Program (HWP), Superfund Section as its Response Project Coordinator. Respondents shall direct all submissions and communications required by this Order to MDNR's Response Project Coordinator at the following.

Name and Title:
Don Van Dyke, Project Manager
Mailing Address:
MDNR Hazardous Waste Program
Superfund Section
P.O. Box 176
Jefferson City, Missouri 65102-0176

Physical Address:
MDNR Hazardous Waste Program
Superfund Section
1730 East Elm Street
Jefferson City, Missouri 65101

Telephone number: 573-522-3351

Facsimile number: 573-751-7869
Electronic mail address: don.van.dyke@dnr.mo.gov

37. The MDNR and Respondents shall have the right, subject to the immediately preceding paragraphs, to change their Project Coordinators. Respondents shall notify MDNR ten (10) business days before such a change is made. The initial notification may be made verbally, but it shall be promptly followed by a written notice.

Work To Be Performed: Supplemental RI/FS Activities

38. Respondents shall perform, at a minimum, the following Supplemental RI/FS activities. All activities required by this Order shall be conducted in accordance with CERCLA, the Missouri Hazardous Waste Management Law, Section 260.350, et seq., RSMo, its implementing regulations, the NCP, and all applicable or relevant and appropriate EPA and state laws, regulations, guidance, policies, and procedures, including any amendments or revisions to such guidance, policies, and procedures.

39. Respondents shall complete the Supplemental RI/FS activities in accordance with the applicable sections of the NCP as published in 40 CFR Part 300, including but not limited to Subparagraph 300.430 and the EPA Guidance for Conducting Remedial Investigations and Feasibility Studies, dated October 1988.

40. The MDNR recognizes that a great deal of investigation has been accomplished for the Former Hulett Lagoon Site. Any such work previously performed using proper data quality procedures may be used to supplement additional work and may be consolidated into the required documents. All previously completed reports, data, and other information that Respondents plan to use in completing the Supplemental RI/FS shall be identified by reference in the Supplemental RI/FS Work Plan.

41. The objective of the Supplemental RI/FS will be to investigate the water producing zones of the aquifer that are contributing to the groundwater contamination and develop alternatives for optimizing the use of the City of Camdenton's Mulberry Well to prevent the migration of TCE.

42. Respondents shall conduct Supplemental RI/FS activities and submit deliverables as provided by the attached Supplemental RI/FS Statement of Work, which is incorporated by reference herein, for the development of the Supplemental RI/FS. All such work shall be conducted in accordance with CERCLA, the NCP, applicable state laws and regulations, and state and EPA guidance and policies including, but not limited to, the "Interim Final Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (OSWER Directive # 9355.3-01), "Guidance for Data Usability in Risk Assessment" (OSWER Directive #9285.7-05) and guidance referenced therein, and guidance referenced in the Statement of Work, as may be amended or modified by EPA.

43. The general activities that Respondents are required to perform are identified below. The tasks that Respondents must perform are described more fully in the Statement of Work and the EPA guidance referenced in Paragraph 39 of this Supplemental AOC. The activities and deliverables identified below shall be developed as provisions in the Supplemental RI/FS Work Plan and shall be submitted to MDNR as provided in the Statement of Work. All work performed under this Order shall be in accordance with the schedules herein, and in full accordance with the standards, specifications, and other requirements of the Supplemental RI/FS Work Plan and existing MDNR approved sampling and analysis procedures utilized during previous RI/FS activities, as initially approved or modified by MDNR, and as may be amended or modified by MDNR from time to time.

    a. Task I: Project Planning or Scoping. Respondents shall conduct scoping activities as described in the attached Statement of Work and referenced guidance. Following approval or modification by MDNR, the Supplemental RI/FS Work Plan, the Supplemental RI/FS Health and Safety Plan, and the Supplemental RI/FS Investigation-Derived Waste Plan shall be incorporated by reference herein. At the conclusion of the project planning phase, Respondents shall provide MDNR with the following deliverables:

        1. Supplemental RI/FS Work Plan. Within sixty (60) days of the Effective Date of this Order, Respondents shall submit to MDNR for review and approval a complete Supplemental RI/FS Work Plan and a reference list of

applicable previously submitted documents used for purposes of completing the Supplemental RI/FS, including any reports the Respondents propose to use as part of the Supplemental RI/FS.

2. Supplemental RI/FS Sampling and Analysis Procedures. The Respondents will conform to the existing MDNR approved sampling and analysis procedures utilized during previous investigation activities for the Former Hulett Lagoon Site throughout the implementation of the Supplemental RI/FS.

3. Supplemental RI/FS Health and Safety Plan (HASP). Within sixty (60) days of the Effective Date of this Order, Respondents shall submit to MDNR for review and comment a Supplemental RI/FS Health and Safety Plan.

4. Supplemental RI/FS Investigation-Derived Waste Plan (IDWP). Within sixty (60) days of the Effective Date of this Order, Respondents shall submit to MDNR for review and approval the Supplemental RI/FS Investigation-Derived Waste Plan.

5. Supplemental RI/FS Schedule. Respondents shall follow the schedule for Work set forth in the Statement of Work.

b. Task II: Community Relations Plan. The MDNR will prepare a Community Relations Plan in accordance with EPA guidance and the NCP. Respondents shall provide information supporting MDNR's community relations programs within twenty (20) days of receiving a request for data.

c. Task III: Supplemental RI/FS Activities. Following MDNR approval or modification of the Supplemental RI/FS Work Plan and associated documents, the Respondents shall implement the provisions of these plans as part of the RI/FS to investigate the water producing zones of the aquifer that are contributing to the groundwater contamination and develop

alternatives for optimizing the City of Camdenton's Mulberry Well to prevent the migration of TCE. The Respondents shall complete the Supplemental RI/FS investigation and evaluation within nine (9) months of MDNR approval or modification of the Supplemental RI/FS Work Plan and associated plans.

d. Task IV: Supplemental RI/FS Sample Analysis and Data Validation. As a continuing part of the Supplemental RI/FS, any and all samples collected by the Respondents shall be analyzed and the results validated.

e. Task V: Supplemental RI/FS Data Evaluation. As a continuing part of the Supplemental RI/FS, the validated data will be used as applicable to support the Supplemental RI/FS.

f. Task VI: Supplemental RI Report/Addendum. Also, within one hundred fifty (150) days after completion of Tasks III – V, the Respondents shall submit to MDNR for review and approval the Supplemental RI Report/Addendum consistent with the Statement of Work, RI/FS Work Plan, and associated documents.

g. Task VII: Supplemental FS Report/Addendum. Within sixty (60) days of the presentation to MDNR and after the approval of Task VI, the Respondents shall submit for MDNR review and approval a Supplemental FS Report/Addendum that incorporates the findings of the Supplemental RI/FS (as applicable to the development of a plan to contain and treat the contamination).

44. Respondents shall not proceed further with any subsequent activities or tasks until receiving MDNR's approval for the following deliverables: Supplemental RI/FS Work Plan and associated plans, the Supplemental RI Report/Addendum, and the Supplemental FS Report/Addendum. Notwithstanding any other provision in this Order, the parties acknowledge and agree that some interim measures may be appropriate at the Former Hulett Lagoon Site. It is expressly agreed that no such measures shall be implemented without prior written approval from MDNR.

45. Upon receipt of the Supplemental FS Report/Addendum, MDNR will evaluate, as necessary, the estimates of the risk to the public and environment that are expected to remain after a particular remedial alternative has been completed.

46. In the event that MDNR takes over some of the tasks, but not the preparation of the Supplemental RI/FS Report/Addendum, Respondents shall incorporate and integrate information supplied by MDNR into the final Supplemental RI/FS Report/Addendum.

Health and Safety Plan

47. Within sixty (60) days after the Effective Date of this Order, the Respondents shall submit for MDNR review and comment a plan that ensures the protection of the public health and safety during performance of Work under this Order. This plan shall be prepared in accordance with EPA's current Standard Operating Safety Guide, dated November 1984, and updated July 1988. If the guide is updated while this Order is in effect, then the Health and Safety Plan shall be updated to reflect changes in the guidance. In addition, the plan shall comply with all current applicable Occupational Safety and Health Administration (OSHA) regulations found at 29 C.F.R. Part 1910. Respondents shall incorporate all changes to the plan recommended by MDNR and implement the plan during the pendency of the Supplemental RI/FS.

Quality Assurance and Sampling

48. The Respondents will conform to the existing MDNR-approved sampling and analysis procedures utilized during previous investigation activities for the Former Hulett Lagoon Site throughout the implementation of the Supplemental RI/FS. All sampling and analyses performed pursuant to this Order shall conform to MDNR direction, approval, and guidance regarding sampling, Quality Assurance/Quality Control (QA/QC), data validation, and chain of custody procedures. Respondents shall ensure that each laboratory used to perform analyses is National Environmental Laboratory Accreditation Conference (NELACP) certified.

49. All sampling and analyses performed pursuant to this Order shall conform to MDNR direction, approval, and guidance regarding

sampling and the procedures utilized during previous investigation activities for the Former Hulett Lagoon Site throughout the implementation of the Supplemental RI/FS. Upon request by MDNR, Respondents shall allow MDNR or its authorized representatives, including but not limited to MDNR's Project Coordinator, to take split and/or duplicate samples of any samples collected by Respondents, its contractor(s), or anyone on behalf of Respondents while performing work under this Order. Respondents shall notify MDNR not less than ten (10) days in advance of any sample collection activity.

50. Respondents shall maintain all analytical data developed in connection with this Order in a searchable electronic database (Microsoft Access, EQUIS or equivalent). The database shall incorporate pertinent sample-specific information that includes, at a minimum: sample matrix (soil, surface water, groundwater, etc.); type (grab, composite, split spoon, etc.); location (including GPS location); depth; date collected; date reported; parameter; concentration; units; detection limits; error range; analytical method; laboratory qualifiers; and any departures from applicable Standard Operating Procedures. Respondents shall enter the analytical data within twenty (20) business days of receipt by Respondents and shall provide an updated copy of the database to MDNR's Project Coordinator on the last business day of each calendar month.

Progress Reports and Meetings

51. Respondents shall submit quarterly written progress reports to MDNR concerning all actions undertaken pursuant to this Order, unless otherwise directed by MDNR's Project Coordinator in writing. These reports shall describe all significant developments during the preceding period, including, but not limited to: the actions performed and any problems encountered, analytical data received during the reporting period, and the developments anticipated for the next two (2) reporting periods, including a schedule of actions to be performed, anticipated problems, and planned resolutions of past or anticipated problems period.

52. Respondents shall, at least thirty (30) days prior to the conveyance of any interest in real property at the Former Hulett Lagoon Site, give written notice that the property is subject to this Order to the transferee and written notice to MDNR of the proposed conveyance,

including the name and address of the transferee. Respondents agree to require that its successor comply with the immediately preceding sentence and the Access to Property and Information requirements of this Order.

53. Respondents shall make presentations at, and participate in, meetings at the request of MDNR during the initiation, implementation, and completion of the Work. In addition to the discussion of the technical aspects of the Work, topics will include anticipated problems or new issues. Meetings will be scheduled at MDNR's discretion.

Final Report – Supplemental RI/FS Report/Addendum

54. The Respondents shall submit for MDNR review and approval a Final Supplemental RI/FS Report/Addendum, detailing the actions taken to comply with this Order. The Supplemental RI/FS Report/Addendum shall generally conform to, as applicable, the guidelines set forth in EPA "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" and the "Risk Assessment Guidelines for Superfund." The Final Supplemental RI/FS Report/Addendum shall include, if applicable, a listing of quantities and types of materials removed off-site or handled on-site-all relevant documentation generated during the response action (e.g., manifests, laboratory reports and permits).

55. The Final Supplemental RI/FS Report/Addendum shall also include the following certification signed by a person who supervised or directed the preparation of that report:

> "Under penalty of law, I certify that to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of the report, the information submitted is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Access to Property and Information

56. Respondents shall provide, and/or obtain access to the Former Hulett Lagoon Site and off-site areas to which access is necessary to implement this Order, and provide access to all records and

documentation related to the conditions at the Former Hulett Lagoon Site and the actions conducted pursuant to this Order. Such access shall be provided to MDNR employees, contractors, agents, consultants, designees, representatives, and state of Missouri representatives. These individuals shall be permitted to access the Former Hulett Lagoon Site and appropriate off-site areas in order to conduct actions, which MDNR determines to be necessary. Nothing herein shall be interpreted as limiting or affecting MDNR's right of entry or inspection authority under state and federal law.

57. Where action under this Order is to be performed in areas owned by or in possession of someone other than Respondents, Respondents shall use its "reasonable best efforts" to obtain all necessary access agreements within forty-five (45) days after the approval of the Supplemental RI/FS Work Plan by MDNR, or as otherwise specified in writing by MDNR.

58. For purposes of this Order, "reasonable best efforts" include the following: agreeing, upon request, to provide splits or duplicates of all samples collected on the property; agreeing, upon request, to provide results of all analyses of samples collected on the property; and providing reasonable compensation to any property owner from whom access is sought.

59. Any such access agreements shall be incorporated by reference into this Order. Respondents shall immediately notify MDNR if, after using its reasonable best efforts, it is unable to obtain such agreements. Respondents shall describe in writing its efforts to obtain access. The MDNR may then assist Respondents in gaining access, to the extent necessary to effectuate the response actions described herein, using such means as MDNR deems appropriate. Respondents shall reimburse MDNR for all costs and attorney's fees incurred by the State of Missouri in obtaining such access, in accordance with the procedures in Section X (Reimbursement of Response Costs).

Record Retention, Documentation, Availability of Information

60. Respondents shall preserve all documents and information relating to work performed under this Order, or relating to the hazardous substances, pollutants or contaminants found on or released from the Former Hulett Lagoon Site, for ten (10) years following the Notice of

Completion issued pursuant to Section XIX of this Order. If during such ten-year period, MDNR requests in writing to review or copy any such documentation or information, Respondents shall provide the original or copies of such documents or information to MDNR within thirty (30) days of receipt of the written request. At the end of this ten (10) year period and thirty (30) days before any document or information is destroyed, Respondents shall notify MDNR that such documents and information are available to MDNR for inspection, and upon request, shall provide the originals or copies of such documents and information to MDNR.

61. Respondents may assert a business confidentiality claim pursuant to Section 260.430, RSMo with respect to part or all of any information submitted to MDNR pursuant to this Order, provided such claim is allowed by applicable law. The MDNR may, at any time, challenge claims of business confidentiality or privilege.

62. Respondents may assert that certain documents or records required to be submitted to MDNR pursuant to this Order are privileged under the attorney-client privilege or are attorney work product. If Respondents assert such a privilege in lieu of providing documents, Respondents shall provide MDNR with the following: (a) the title of the document or record; (b) the date of the document or record; (c) the name and title of the author of the document or record; (d) the name and title of each addressee and recipient; (e) a description of the subject matter of the document or record sufficient for purposes of identification of the document, except that no description so specific as to constitute a waiver of the privilege shall be required; and (f) an identification of the privilege claimed and the basis for assertion of the privilege. However, no document or record created or generated pursuant to the requirements of this Order shall be withheld on the grounds that it is privileged. Any document or record for which Respondents assert such a privilege shall not be destroyed until Respondents receive a notification from MDNR authorizing such destruction. Respondents shall maintain a running log of privileged documents on a document-by-document basis, containing the date, author(s), addressee(s), subject, the privilege or grounds claimed (e.g., attorney work product, attorney-client), and the factual basis for assertion of the privilege. Respondents shall keep the "privilege log" on file and available for inspection. The MDNR may at any time challenge claims of privilege.

Off-Site Shipments

63. All hazardous substances, pollutants or contaminants removed off site pursuant to this Order for treatment, storage, or disposal shall be treated, stored, or disposed of at a facility in compliance, as determined by MDNR, with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. Upon request, MDNR's Project Coordinator will provide information to the Respondents on the acceptability of a facility under Section 121(d)(3) of CERCLA and the above rule.

64. Unless impracticable, prior notification of out-of-state waste shipments should be given consistent with OSWER Directive 9330.2-07.

Compliance with Other Laws

65. Respondents shall perform all actions required pursuant to this Order in accordance with all applicable local, state, and federal laws and regulations except as provided in Section 121(e) of CERCLA, 42 U.S.C. § 9621(e), and 40 C.F.R. Section 300.415(i), and 40 C.F.R. § 300.430.

Emergency Response and Notification of Releases

66. If any incident or change in the conditions of the Former Hulett Lagoon Site occurs during the implementation of actions conducted pursuant to this Order that causes or threatens to cause an additional release of Hazardous Substances from the Former Hulett Lagoon Site or an endangerment to the public health, welfare, or the environment, the Respondents shall immediately take all appropriate action. The Respondents shall take such action in accordance with all applicable provisions of this Order, including, but not limited to the Health and Safety Plan, in order to prevent, abate or minimize such release or endangerment caused or threatened by the release. Respondents shall also immediately notify MDNR's Project Coordinator or, in the event of his/her unavailability:

Duty Officer
Environmental Emergency Response Section
Environmental Services Program
Missouri Department of Natural Resources
2701 West Main Street
P.O. Box 176

Jefferson City, MO 65102-0176
573-634-2436 (24-hour number)

of the incident or Former Hulett Lagoon Site conditions. If Respondents fail to adequately respond, MDNR may respond to the release or endangerment and reserves the right to pursue cost recovery.

67. Respondents shall submit a written report to MDNR within seven (7) days after each release, incident, or change in Former Hulett Lagoon Site conditions setting forth the events that occurred and the measures taken or to be taken to mitigate any release or potential release or endangerment caused or threatened by the release or potential release and to prevent the reoccurrence of such a release or potential release. This reporting requirement is in addition to, not in lieu of, reporting required under Section 103(c) of CERCLA and 48 C.F.R. 23, of the Emergency Planning and Community Right-To-Know Act of 1986 ("EPCRA"), 42 U.S.C. § 11001 et seq.

VIII. MDNR APPROVAL OF SUBMITTALS

68. The following procedure will apply to the review and approval of all documents submitted to MDNR for review and approval pursuant to the requirements of this Order. The MDNR will review each such document and notify Respondents, in writing, as to its approval or disapproval thereof. In the event MDNR does not approve any such document, it will provide a written statement as to the basis of the disapproval. Within thirty (30) business days of receipt of MDNR comments, or such other time period as agreed to by the Parties, Respondents shall revise any document not approved by MDNR addressing MDNR's written comments and resubmit it to MDNR. Revised submittals are subject to MDNR approval, approval with conditions, disapproval or disapproval with modifications by MDNR, subject to dispute resolution. Subject only to the outcome of any dispute resolution proceeding, MDNR will make the final determination as to whether the document submitted by Respondents is in compliance with the requirements of this Order. At that time when MDNR determines that the document is in compliance with the requirements of this Order, MDNR will transmit to Respondents a written statement to that effect.

69. The MDNR reserves the right to comment on, modify, and direct

changes for all deliverables. At MDNR's discretion Respondents must fully correct all deficiencies and incorporate and integrate all information and comments supplied by MDNR either in subsequent or resubmitted deliverables.

70. Neither failure of MDNR to expressly approve or disapprove of Respondents' submissions within a specified time period(s), nor the absence of comments, shall be construed as approval by MDNR. Whether or not MDNR gives express approval for Respondents' deliverables, Respondents are responsible for preparing deliverables acceptable to MDNR.

71. In the event that Respondents amend or revise a report, plan or other submittal upon receipt of MDNR comments, if MDNR subsequently disapproves of the revised submittal, or if subsequent submittals do not fully reflect MDNR's directions for changes, MDNR retains the right to seek stipulated or statutory penalties; perform its own studies, complete the Work (or any portion of the Work) under CERCLA and the NCP, and seek reimbursement from the Respondents for its costs; and/or seek any other appropriate relief.

72. MDNR-approved documents shall be deemed incorporated into and made part of this Order. Prior to this written approval, no work plan, report, specification, or schedule shall be construed as approved and final. Oral advice, suggestions, or comments given by MDNR representatives will not constitute an official approval, nor shall any oral approval or oral assurance of approval be considered binding.

IX. AUTHORITY OF MDNR'S PROJECT COORDINATOR

73. The MDNR's Project Coordinator shall be responsible for overseeing the Respondents' proper and complete implementation of this Order. The MDNR's Project Coordinator shall have the authority vested in an OSC and a RPM by the NCP, including the authority to halt, conduct, or direct any action required by this Order, or to direct any other response action undertaken by MDNR or Respondents at the Site. The absence of MDNR's Project Coordinator or designee(s) from the Site shall not be cause for stoppage of work unless specifically directed by MDNR's Project Coordinator.

X. REIMBURSEMENT OF COSTS

74. Within ninety (90) days of the effective date of this Order, Respondents shall reimburse MDNR for all Past Response Costs totaling $34,065.84, not inconsistent with the NCP, incurred by MDNR with respect to this Order, pursuant to the payment instructions set forth in Paragraphs 75 and 76.

75. On a periodic basis, MDNR shall submit to the Respondents a standard accounting of all Future Response Costs incurred by the State at the Former Hulett Lagoon Site with respect to this Order per the State's SAMII accounting system. The Respondents shall, within forty-five (45) days of receipt of each accounting for Future Response Costs, remit a corporate check to MDNR for the amount of those future costs, made payable to the "Missouri Hazardous Waste Fund." Interest shall accrue from the date the payment is due at the rate determined by the Secretary of the Treasury on the unpaid balance until such costs and accrued interest have been paid in full. On October 1 of each subsequent fiscal year, any unpaid balance will begin accruing interest at the rate determined by the Secretary of the Treasury. Interest will be compounded annually.

76. Respondents' checks for Past and Future Response Costs shall identify the name of the Site, the EPA site identification number if applicable, the title and MDNR Docket Number for this Order, and be forwarded to:

Missouri Department of Natural Resources
Attention: Chief, Superfund Section
Hazardous Waste Program
P.O. Box 176
Jefferson City, Missouri 65102-0176.

77. Respondents may dispute all or part of a bill for Future Response Costs submitted under this Order if Respondents allege that MDNR has made an accounting error, or if a cost is not a Future Response Cost. If any dispute over any Future Response Costs is resolved before payment is due, then the amount due will be adjusted accordingly. If the dispute is not resolved before payment is due, Respondents shall pay the full amount of the uncontested costs into the Missouri Hazardous Waste Fund as specified above on or before the due date. Within the same time period, Respondents shall pay

the full amount of the contested costs into an interest-bearing escrow account. Respondents shall simultaneously transmit a copy of both checks to MDNR Project Coordinator. Respondents shall ensure that the prevailing party receives the amount due from the escrow fund, within thirty (30) days after the date the dispute is resolved.

XI. STIPULATED AND STATUTORY PENALTIES

78. In the event the Respondents fail to meet any requirement of this Order, Respondents shall pay stipulated penalties as set forth below. Compliance by Respondents shall include completion of an activity under this Order or a Plan approved under this Order or any matter under this Order in accordance with the requirements of this Order and within the specified time schedules in and approved under this Order.

79. For each day, or portion thereof, that Respondents fail to provide major deliverables, i.e. the Supplemental RI/FS Work Plan, Draft Supplemental RI Report/Addendum, Draft Supplemental FS Report/Addendum, and/or Supplemental RI/FS Final Report/Addendum, Respondents shall be liable as follows:

    a. $200 per day for the first through seventh day of noncompliance;
    b. $350 per day for the eight through the fourteenth day of noncompliance;
    c. $750 per day for the fifteenth through the thirtieth day of noncompliance; and
    d. $1,500 per day for the thirty-first day and each succeeding day of noncompliance thereafter.

80. For each day, or portion thereof, that Respondents fail to provide lesser documents, for example memoranda, reports and work plans, in accordance with the schedules established pursuant to this Order, Respondents shall be liable as follows:

    a. $100 per day for the first through seventh day of noncompliance;
    b. $250 per day for the eight through the fourteenth day of noncompliance;
    c. $450 per day for the fifteenth through the thirtieth day of

noncompliance; and

d. $750 per day for the thirty-first day and each succeeding day of noncompliance thereafter.

81. For each day, or portion thereof, that Respondents fail to perform or provide actions or deliverables, not described in the above two preceding paragraphs, in accordance with the schedules established pursuant to this Order, Respondents shall be liable as follows:

a. $100 per day for the first through the fourteenth day of noncompliance;
b. $200 per day for the fifteenth through the thirtieth day of noncompliance;
c. $400 per day for the thirtieth through the forty-fifth day of noncompliance; and
d. $800 per day for the forty-sixth day and each succeeding day of noncompliance thereafter.

82. All penalties shall begin to accrue on the date that performance is due or a violation occurs and shall continue to accrue through the final day of correction of the noncompliance.

83. Upon receipt of written demand by MDNR, Respondents shall make payment to MDNR within forty-five (45) calendar days. Interest shall accrue on late payments as of the 31st day after receiving notice the payment is due.

84. Even if violations are simultaneous, separate penalties shall accrue for separate violations of this Order. Penalties accrue and are assessed per violation per day. Penalties shall accrue regardless of whether MDNR has notified Respondents of a violation or act of noncompliance. The payment of penalties shall not alter in any way Respondents' obligation(s) to complete the performance of the Work required under this Order.

85. Except for those violations for which stipulated penalties have been assessed by MDNR and paid by Respondents, violation of any provision of this Order may subject Respondents to civil penalties of up to ten thousand dollars ($10,000) per violation per day, as provided in Section 260.425, RSMo. Respondents may also be subject to punitive damages in an amount up to three times the amount of any cost incurred by the

State of Missouri as a result of such violation, as provided in section 260.530, RSMo. The payment of penalties shall not alter in any way Respondents' obligation(s) to complete the performance of the Work required under this Order.

86. Respondents shall make all penalty payments by forwarding a corporate check, payable to "State of Missouri (Camden County)" to the Office of the Attorney General, P.O. Box 899, Jefferson City, Missouri, 65102-0899, Attention Collections Specialist, Financial Services Division.

87. Checks must identify the name of the Former Hulett Lagoon Site, the location of the Former Hulett Lagoon Site, the EPA identification number for the Former Hulett Lagoon Site and MDNR docket number of this Order. A copy of the check and transmittal letter shall be forwarded to MDNR's Project Coordinator.

XII. MDNR RESERVATION OF RIGHTS

88. Except as specifically provided in this Order, nothing herein shall limit the power and authority of the Missouri Department of Natural Resources or the State of Missouri to take, direct, or order all actions necessary to protect public health, welfare or the environment, or to prevent, abate or minimize an actual or threatened release of hazardous substances, pollutants or contaminants or hazardous or solid waste on, at, or from the Former Hulett Lagoon Site.

89. Further, except as specifically provided in this Order, nothing herein shall prevent MDNR from seeking legal or equitable relief to enforce the terms of this Order, from taking other legal or equitable action as it deems appropriate and necessary, or from seeking to require Respondents in the future to perform additional activities or to reimburse the state for any injury to its natural resources pursuant to CERCLA, Section 260.500, et seq., RSMo, or any other applicable law, including the common law of public nuisance.

90. The MDNR reserves the right to bring an action against Respondents under Section 107 of CERCLA, 42 U.S.C. § 9607 and/or § 260.530, RSMo, for recovery of any Future Response Costs incurred by the State of Missouri related to the Former Hulett Lagoon Site and not reimbursed by Respondents.

91. Notwithstanding any other provision of this Order, MDNR reserves the right to perform its own studies, complete the work (or any portion of the work) required by this Order, and seek reimbursement from Respondents for its costs, or seek appropriate relief. Respondents reserve all defenses to any such action.

92. Nothing in this Order shall constitute or be construed as a release from any claim, cause of action or demand at law or in equity against any person not a party to this Order for any liability arising out of or relating in any way to the Former Hulett Lagoon Site.

93. In the event a court issues an order that invalidates any provisions of this Order or finds that Respondents have sufficient cause not to comply with one or more provisions of this Order, Respondents shall remain bound to comply with all provisions of this Order not invalidated by such court's order.

XIII. FORCE MAJEURE

94. Respondents agree to perform all requirements under this Order within the time limits established under this Order, unless the performance is delayed by a force majeure event. For purposes of this Order, a force majeure event is defined as any event arising from causes not foreseeable and beyond the control of Respondents or of any entity controlled by Respondents, including but not limited to, its consultants, contractors, subcontractors or agents, that delays or prevents performance of any obligation under this Order despite Respondents' reasonable best efforts to fulfill the obligation. Force majeure does not include financial inability to complete the work, unanticipated or increased costs of performance, normal precipitation events, changed economic circumstances or failure to obtain federal, state or local permits unless Respondents have diligently pursued and applied for such permits. Force majeure does include the inability to perform any Work because such Work would be inconsistent with any order entered by any court.

95. Respondents shall immediately notify MDNR orally, and shall also notify MDNR in writing within five (5) days after Respondents become aware of events that constitute a force majeure. Such notice shall: identify the event causing the delay or anticipated delay; estimate the

anticipated length of delay, including necessary demobilization and re-mobilization; state the measures taken or to be taken to minimize the delay; and estimate the timetable for implementation of the measures.

96. Respondents shall exercise reasonable best efforts to avoid and minimize any delay caused by a force majeure. Failure to comply with the notice provision of this section shall waive any claim of force majeure by the Respondents.

97. If MDNR determines a delay in performance of a requirement under this Order is or was attributable to a force majeure, the time period for performance of that requirement shall be extended as deemed necessary by MDNR. Such an extension shall not alter Respondents' obligation to perform or complete other tasks required by the Order which are not directly affected by the force majeure.

XIV. OTHER CLAIMS

98. By entering into this Order, MDNR assumes no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondents. The MDNR shall not be deemed a party to any contract entered into by Respondents or its directors, officers, employees, agents, successors, representatives, assigns, contractors or consultants in carrying out actions pursuant to this Order.

99. Nothing in this Order constitutes a satisfaction of or release from any claim or cause of action against the Respondents or any person not a party to this Order, for any liability such person may have under CERCLA, RCRA, or other statutes, or the common law, including but not limited to any claims of MDNR for costs, damages and interest under Sections 106(a) and 107(a) of CERCLA, 42 U.S.C. §§ 9606(a) and 9607(a).

100. This Order does not constitute a pre-authorization of funds under Section 111(a)(2) of CERCLA, 42 U.S.C. § 9611(a)(2). The Respondents waive any claim to payment under Sections 106(b), 111, and 112 of CERCLA, 42 U.S.C. §§ 9606(b), 9611, and 9612, against the United States or the Hazardous Substance Superfund arising out of any action performed under this Order.

101. No action or decision by MDNR pursuant to this Order shall give rise to

any right to judicial review except as set forth in Section 113(h) of CERCLA, 42 U.S.C. § 9613(h).

XV. COVENANT NOT TO SUE

102. Upon receipt of the full amount of Past Response Costs as set out above in Paragraph 104, MDNR covenants not to sue Respondents for Past Response Costs. In consideration of the Work that will be performed and the payments that will be made by the Respondents under the terms of this Order, and except as specifically reserved in Section XII (MDNR Reservation of Rights) of this Order, MDNR covenants not to sue and agrees not to assert any claims or causes of action or take administrative action against Respondents for Matters Addressed pursuant to Sections 106 and 107 of CERCLA, 42 U.S.C. §§ 9606 and 9607, or Section 260.530, et seq., RSMo. The MDNR's covenants shall take effect with respect to Respondents upon MDNR's issuance of a Notice of Completion pursuant to Section XIX of this Order. The MDNR's covenants in this paragraph extend only to Respondents and do not extend to any other persons.

XVI. CONTRIBUTION PROTECTION

103. With regard to claims for contribution against Respondents for matters addressed in this Order, the Parties hereto agree that the Respondents are entitled to protection from contribution actions or claims to the extent provided by Section 113(f)(2) and 122(h)(4) of CERCLA, 42 U.S.C. Sections 9613(f)(2) and 9622(h)(4). Nothing in this Order precludes MDNR or the Respondents from asserting any claims, causes of action or demands against any persons not parties to this Order for indemnification, contribution, or cost recovery.

XVII. INDEMNIFICATION

104. Respondents agree to indemnify, save and hold harmless MDNR, its officials, agents, contractors, subcontractors, employees and representatives from any and all claims or causes of action: (a) arising from, or on account of, acts or omissions of Respondents, Respondents' officers, heirs, directors, employees, agents, contractors, subcontractors, receivers, trustees, successors or assigns, in carrying out actions pursuant to this Order; and (b) for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between

Respondents, and any persons for performance of work on or relating to the Former Hulett Lagoon Site, including claims on account of construction delays. In addition, Respondents agree to pay MDNR all costs incurred by MDNR, including litigation costs arising from or on account of claims made against MDNR based on any of the acts or omissions referred to in the preceding paragraph.

XVIII. MODIFICATIONS

105. Minor modifications to any plan or schedule may be made in writing by MDNR Project Coordinator and Respondents' Project Coordinator. The remainder of the Order or any portion of the Order, including the attached Statement of Work may only be modified in writing by signature of the delegated MDNR signatory or his/her designee and by signature of the parties.

106. If Respondents seek permission to deviate from any approved plan or schedule (or the Statement of Work), Respondents' Project Coordinator shall submit a written request to MDNR for approval outlining the proposed modification and its basis.

107. No informal advice, guidance, suggestion or comment by MDNR regarding reports, plans, specifications, schedules, or any other writing submitted by Respondents shall relieve the Respondents of their obligation to obtain such formal approval as may be required by this Order, and to comply with all requirements of this Order unless and until this Order is formally modified.

XIX. NOTICE OF COMPLETION

108. When MDNR determines, after MDNR's review of the Final Reports and other deliverables, that all actions and requirements have been fully performed in accordance with this Order, with the exception of any continuing obligations such as the record retention requirements of the Order, MDNR will provide a Notice of Completion to Respondents. If MDNR determines that any work has not been completed in accordance with this Order, MDNR will notify Respondents in writing, providing a list of the deficiencies and a schedule for completing the work. If appropriate, MDNR notification may require Respondents to modify a work plan to correct such deficiencies in accordance with the schedule contained in MDNR's notice. Any required modified work

plan is subject to MDNR's review and approval pursuant to Section VIII. Respondents shall implement any such modified work plan as finally approved or modified by MDNR, complete the work, and submit a modified Final Report in accordance with the schedule set forth in MDNR notice. Failure by Respondents to implement an MDNR-approved or modified work plan and complete the work shall be a violation of this Order.

XX. ADDITIONAL WORK

109. If MDNR determines that additional work not included in an approved plan is necessary in order to complete the Supplemental RI/FS, MDNR will notify Respondents of that determination. Respondents shall confirm its willingness to perform the additional work in writing to MDNR within thirty (30) days of receipt of MDNR request, or Respondents shall invoke the dispute resolution provisions of Paragraph XXII of this Order. Subject to resolution of any dispute, Respondents shall implement the additional tasks, which MDNR determines are necessary. Unless otherwise stated by MDNR, or unless Respondents invokes dispute resolution, within sixty (60) days of receipt of notice from MDNR that additional work is necessary, Respondents shall submit for approval by MDNR a Work Plan for the additional work. This work plan shall conform to the applicable requirements of Section VII of this Order. Upon MDNR's approval of the Work Plan, or MDNR's modification of the Work Plan, pursuant to Section VIII (Agency Approval of Submittals) of this Order, Respondents shall implement the plan for additional work in accordance with the provisions and schedules contained therein. The MDNR reserves the right to conduct the work itself at any point, to seek reimbursement from Respondents, and/or to seek any other appropriate relief.

XXI. PUBLIC PARTICIPATION

110. The MDNR will provide the public an opportunity to review and comment on the Proposed Plan as defined in Appendix 1 that the MDNR will develop based on the Supplemental RI/FS Report/Addendum.

111. Following the public comment period, MDNR shall determine any appropriate changes to the Proposed Plan as a result of the public

participation and notify Respondents pursuant to Section IX of any additional work required.

XXII. DISPUTE RESOLUTION

112. The Parties to this Order shall attempt to resolve, expeditiously and informally, any disagreements concerning this Order.

113. If any Respondent(s) objects to any MDNR action taken pursuant to this Order, including billings for Future Response Costs, Respondent(s) shall notify MDNR in writing of its/their objection within thirty (30) calendar days of such action, unless the objection has been informally resolved. This notice shall set forth the specific points of the dispute, the position it is maintaining should be adopted as consistent with the requirements of this Order, the factual and legal bases for its position, and all matters it considers necessary for MDNR's determination.

114. The Parties shall have thirty (30) calendar days from MDNR's receipt of the Respondents' written objections to attempt to resolve the dispute through formal negotiations ("Negotiation Period"). The Negotiation Period may be extended by agreement of the Parties.

115. Any agreement reached by the Parties pursuant to this section shall be in writing, signed by parties to the dispute, and shall, upon the signature by all parties to the dispute, be incorporated into and become an enforceable element of this Order. If the Parties are unable to reach an agreement within the Negotiation Period, the Director, Division of Environmental Quality, MDNR, will issue a written decision on any dispute to the Respondents. The decision of MDNR shall be incorporated into and become an enforceable element of this Order upon Respondents' receipt of MDNR decision regarding the dispute. Respondents' obligations under this Order shall not be tolled by submission of any objection for dispute resolution under this section, unless otherwise agreed to by the Parties, taking into account Respondents' good faith in invoking the Dispute Resolution procedure.

116. The MDNR decision shall be binding on the Respondents unless, within 30 days of receipt of the decision, the Respondents file with a court of competent jurisdiction and serve on the parties a motion for judicial review of the decision setting forth the matter in dispute, the efforts made by the parties to resolve it, the relief requested, and the schedule,

if any, within which the dispute must be resolved to ensure orderly implementation of the Order. The MDNR may file a response to Respondents' motion. Judicial review of any dispute governed by this Paragraph shall be governed by applicable principles of law.

117. Following resolution of the dispute, as provided by this section, Respondents shall fulfill the requirement that was the subject of the dispute in accordance with the agreement reached, with MDNR's decision, or the court's order, whichever occurs.

XXIII. SEVERABILITY

118. If a court issues an order that invalidates any provision of this Order or finds that Respondents have sufficient cause not to comply with one or more provisions of this Order, Respondents shall remain bound to comply with all provisions of this Order not invalidated or determined to be subject to a sufficient cause defense by the court's order.

XXIV. EFFECTIVE DATE AND COMPUTATION OF TIME

119. This Order shall become effective upon MDNR's signature, as the final signatory, to this Order. All times for performance of ordered activities shall be calculated from this effective date.

IT IS SO AGREED:

Missouri Department of Natural Resources:

3/21/16
Date

Leanne Tippett Mosby, Director
Division of Environmental Quality

Missouri Attorney General's Office:

3/16/16
Date

Chris Koster
Attorney General

Thais Ann Folta
Assistant Attorney General

For Hamilton Sundstrand Corporation, a subsidiary of United Technologies Corporation:

Date:_____

_____
Name

Title_____

For City of Camdenton:

Date:_____

_____
Name

Title_____

For Modine Manufacturing Company:

Date:_____

_____
Name

Title_____

IT IS SO AGREED:

Missouri Department of Natural Resources:

3/21/16
Date

Leanne Tippett Mosby
Leanne Tippett Mosby, Director
Division of Environmental Quality

Missouri Attorney General's Office:

Date

Chris Koster
Attorney General

Daren R. Eppley
Assistant Attorney General

For Hamilton Sundstrand Corporation, a subsidiary of United Technologies Corporation:

Date:_____

Name

Title_____

For City of Camdenton:

Date: 3/2/16

Jake L McCubbin
Name

Title MAYOR

For Modine Manufacturing Company:

Date:_____

Name

Title_____

IT IS SO AGREED:

Missouri Department of Natural Resources:

_____ _____

Date Leanne Tippett Mosby, Director
Division of Environmental Quality

Missouri Attorney General's Office:

_____ _____

Date Chris Koster
Attorney General

Daren R. Eppley
Assistant Attorney General

For Hamilton Sundstrand Corporation, a subsidiary of United Technologies Corporation:

Date: Feb. 22, 2016

Name Christoph Feddersen

Title Vice President - General Counsel

For City of Camdenton:

Date:_____

Name

Title_____

For Modine Manufacturing Company:

Date:_____

Name

Title_____

IT IS SO AGREED:

Missouri Department of Natural Resources:

_____ _____

Date Leanne Tippett Mosby, Director
Division of Environmental Quality

Missouri Attorney General's Office:

_____ _____

Date Chris Koster
Attorney General

Daren R. Eppley
Assistant Attorney General

For Hamilton Sundstrand Corporation, a subsidiary of United Technologies Corporation:

Date:_____ _____

Name

Title_____

For City of Camdenton:

Date:_____ _____

Name

Title_____

For Modine Manufacturing Company:

Date: 2/25/16 Scott J Wollenberg

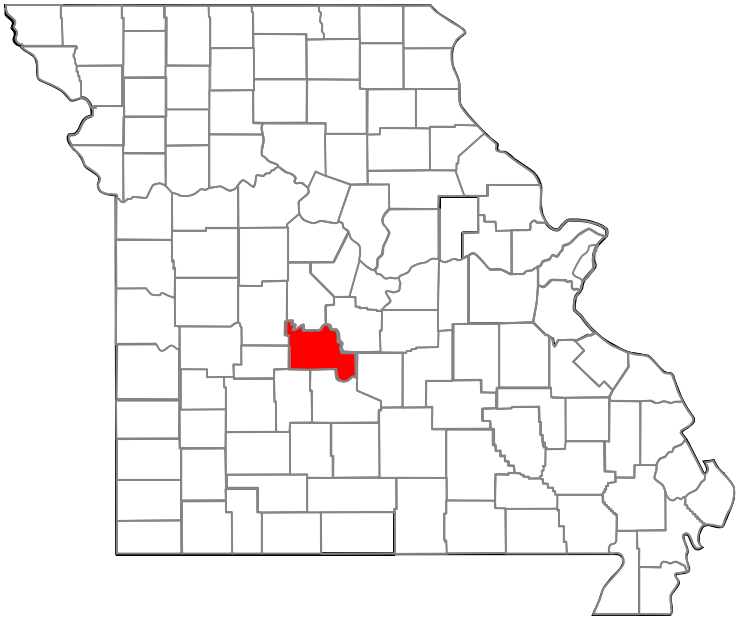
Name Scott Wollenberg

Title Vice President - Americas

SITE INSPECTION SAMPLING AND ANALYSIS PLAN

Camdenton Treatment Plant Lagoon Site
Camden County, Missouri

December 17, 2018



MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Prepared By:

Missouri Department of Natural Resources
Division of Environmental Quality
Hazardous Waste and Environmental Services Programs

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Tables

Appendices

1.0 Introduction

As authorized under the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986, the Missouri Department of Natural Resources (Department), Hazardous Waste Program (HWP), Site Assessment Unit (SAU) is conducting a Site Inspection (SI) at the Camdenton Treatment Plant Lagoon (CTPL) site. The CTPL site is the former location of a domestic wastewater treatment lagoon in Camdenton, Missouri.

The objective of the investigation is to assess potential threats to human health and the environment at the site and if necessary, gather data for the preparation of a preliminary site score under the Hazard Ranking System (HRS). The scope of the SI includes sampling of soil gas and shallow groundwater.

2.0 Site Information

2.1 Location

The CTPL site, also known as the C.P. White Lagoon, is the location of former eight-acre, two-cell wastewater treatment lagoon built in the early 1960s and operated by the city of Camdenton. The address is 1164 Ha Ha Tonka Road in Camdenton, and the geographical coordinates are 37.990862 decimal degrees latitude, -97.766473 decimal degrees longitude. Figure 1 provides a one-mile radius site location map with an inset showing the approximate boundaries of the former lagoon. Following closure, a portion of the lagoon was redeveloped as the location of the Camdenton's current wastewater treatment plant (WWTP) (Figure 1).

The site lies in a narrow wooded valley at the confluence of two unnamed intermittent streams. The valley floor topography is flat and vegetated with grasses and wetland plants. Access to the

site is through a lockable gate on a dead-end road. Surface water runoff flows to the northern portion of the former lagoon which now serves as a storm water collection pond (Figure 1). The WWTP discharges through two outfalls into an unnamed stream northwest of the former lagoon (Figure 1). The specific discharge point(s) from the former lagoon is not known, but would likely have been in this same area. The unnamed stream continues for approximately 0.5 miles before entering the Niangua arm of Lake of the Ozarks. The treatment plant includes an 800 ft^2 office building with 2 full time employees. There are two residences within 0.25 miles of the CTPL; the nearest one is 350 feet to the east on a ridge above the valley (visible in Figure 2).

2.2 Site History/Operation

The CTPL was one of several individual treatment lagoons the city maintained prior to opening a centralized WWTP in June 1989. The WWTP, visible in Figure 2, is located in the same area as the CTPL. The lagoon was one of several operated by the city to receive and treat sources of wastewater within the City of Camdenton prior to the opening of the WWTP in 1989. One of the other city lagoons, City Lagoon #3 (also known as the Hulett Lagoon), received a mixture of domestic wastewater and effluent from a refrigeration coil manufacturing facility located at 221 Sunset Drive, located approximately 600 feet southwest of Lagoon #3 (Figure 1). That facility used TCE as a degreasing agent, and releases of TCE from the facility to Lagoon #3 in the plant's wastewater discharge resulted in contamination of the sludge, surrounding soils and groundwater beneath the lagoon (Wilder, 1999). Following the initial discovery by the City of Camdenton of TCE contamination in Lagoon #3 in 1984, the city completed a cleanup at Lagoon #3 in 1989 involving the removal of 2,395 cubic yards of contaminated sludge and soil (Wilder, 1999). The lagoon was subsequently closed by filling with soil scraped from a nearby slope.

Releases of TCE at the 221 Sunset Drive facility, Lagoon #3 and potentially other associated locations in the Camdenton area lead to the contamination of one of the city's public wells with

TCE. The Mulberry Well, located approximately ¼ mile southeast of the facility, was taken offline by the city on February 2, 1999, following discovery of TCE contamination in a sample from the well. Various rounds of investigation and cleanup have been conducted at the facility, Lagoon #3 and other locations in Camdenton since 1999, continuing to present day.

The department is currently negotiating with the responsible parties on an agreement to address TCE contamination in Camdenton associated with the 221 Sunset Drive facility. Responsible parties include the City of Camdenton, UTC Aerospace Systems (corporate successor to Sundstrand Tubular Products, Inc who operated the facility at the time of the TCE usage), and the Modine Manufacturing Company (owner of the facility subsequent to 1990 when TCE use was discontinued).

The department held a public meeting on September 28, 2017, to address citizen questions and concerns about TCE contamination in the Camdenton area. Following that meeting, a public citizen concern group was formed. The Camdenton Industrial TCE Contamination Advisory Team (CITCAT) was convened and subsequently met on October 18, 2017. Members of the CITCAT recommended the department investigate other potential areas of TCE release associated with the 221 Sunset Drive facility, including the CTPL (CITCAT, 2017). CITCAT group members expressed concern that the CTPL may have received TCE-contaminated wastewater effluent from the 221 Sunset Drive facility.

The Department initiated and completed a Pre-CERCLA Screening investigation for the CTPL site in 2018. Historical records indicate that following disconnection of City Lagoon #3 from the Sunset Drive facility in December 1987, the facility's wastewater was rerouted to the CTPL. As noted, the CTPL was closed on June 8, 1989, when the WWTP became operational. Therefore, during an 18-month period between December 1987 when City Lagoon #3 ceased operation and June 8, 1989 when the WWTP began operation, the CTPL received industrial wastewater

effluent from the 221 Sunset Drive facility. During this same period, the facility operated a wastewater pre-treatment system designed to remove heavy metals prior to discharge. Available discharge volume and effluent TCE concentration data were used to estimate the mass of TCE that may have been released to the CTPL in wastewater effluent from the Sunset Road facility (38 lbs) over this 18-month period (Stroh, 2018). Based on the potential release of hazardous substances to the CTPL, the Department recommended further CERCLA assessment.

3.0 Data Quality Objectives

To help ensure precise, accurate, representative, complete, and comparable data, all field work and analyses will be conducted in accordance with the Quality Assurance Project Plan (QAPP) for Pre-Remedial/Pre-Removal Site Assessments, Revision 8, December 29, 2017, and ongoing (MDNR, 2017). That QAPP is revised every 5 years and provides generic data quality objectives (DQOs) for the full range of CERCLA site assessment sampling activities the Department conducts. Those DQOs specific to this Site Inspection project are described below.

3.1 Problem Statement

For an 18-month period in 1988 and 1989, the Camdenton Treatment Plant Lagoon received industrial wastewater effluent from a refrigeration coil manufacturing facility located at 221 Sunset Drive in Camdenton. The facility used trichloroethene (TCE) to degrease metal parts during this period and the effluent entering the CTPL contained dissolved TCE. Based on the potential for release of a hazardous substance at the CTPL site, further CERCLA assessment is necessary to document the release and evaluate potential exposure pathways.

3.2 Planning Team

The planning team includes staff from the HWP Superfund Section, EPA Region 7, ESP Field Services and Chemical Analysis Sections, the Department of Health and Senior Services and the Missouri Geological Survey.

3.3 Conceptual Site Model

3.3.1 Site Setting

The depth and composition of the soil/residuum at the CTPL has not been documented. The native material in the general area is Roubidoux Formation residuum consisting of sandy red clay with chert fragments. No specific construction records for the CTPL are available, but the common practice was to line lagoon excavations with compacted clay to retard infiltration and retain wastewater to allow for settling of solids. It is not known whether wastewater solids or clay were removed from the CTPL prior to filling the lagoon in, and these materials may still be present. According to the Camdenton Director of Public Works, portions of the CTPL were backfilled with white rock prior to construction of the WWTP to a depth of up to 10 feet (Jefferies, 2018).

The unconfined Ozark Aquifer is present beneath the residuum. This aquifer consists of dolomite, sandy dolomite and sandstone and is known to be karstic. Public and private wells in the area obtain drinking water from the Ozark Aquifer. Depth to groundwater in the aquifer has not been determined at the CTPL, but based on measurements in area wells, is estimated to be approximately 150 feet below ground surface. Flow direction in the Ozark Aquifer is expected to be southwest toward the Lake of the Ozarks.

3.3.2 Contaminant Release

Releases of TCE-contaminated wastewater to the CTPL are suspected to have occurred over an 18-month period in 1988 and 1989. Contaminants of concern (COCs) include TCE and its daughter products 1,1-dichloroethene, cis- and trans- 1,2-dichloroethene and vinyl chloride. Using the maximum TCE result measured in the manufacturing facility effluent as a conservative value and the average daily discharge volume from the facility's pre-treatment system, the total mass of TCE potentially released to the CTPL over the 18 month period of concern is estimated at 17 kilograms (Stroh, 2018).

3.3.3 Contaminant Migration Pathways and Mechanisms

The TCE released to the CTPL was dissolved in the wastewater discharge from the Sunset Drive facility. The relatively small volume of the industrial discharge compared to the overall inflow of wastewater to the CTPL, would have resulted in significant dilution of the TCE. Additional reductions in TCE concentrations would likely have occurred through volatilization to the atmosphere from the lagoon surface, especially during warm weather. Natural biotic degradation processes are known to act on TCE and these may have further reduced TCE concentrations in the lagoon water. Small amounts of residual TCE present in the lagoon water may have percolated into the lagoon clay liner/overburden along with infiltrating wastewater, potentially entering shallow groundwater. Shallow groundwater recharge to the Ozark Aquifer locally at the CTPL could have contained some TCE.

If residual TCE is present at sufficient levels in the shallow subsurface at the CTPL, either in the clayey soil or in shallow groundwater, it could partition into soil gas. Shallow soil gas TCE contamination present beneath structures could enter the buildings through vapor intrusion.

3.3.4 Potential Receptors

The area surrounding the site is sparsely populated. The nearest residential properties are located to the east (350 feet away) and southeast (800 feet away) (Figure 1). Both of these properties have private drinking water wells. Private well sampling conducted as part of the Dawson Metals Products Site Inspection investigation identified and sampled 17 private wells in the vicinity of the CTPL (Figure 1). Two wells located near the CTPL were included in this sampling. No TCE was detected in any of the wells. Based on the small mass of TCE estimated to have been released to the CTPL and the lack of TCE detections in private wells in the vicinity, the groundwater/drinking water pathway is not expected to be of significant concern.

The nearest structure to the CTPL is the office building for the WWTP which was constructed over part of the former lagoon (Figure 1). There are two full-time employees in the office building working 8-hour day shifts.

3.4 Study Questions

The principal study question is to determine whether there are concentrations of COCs in shallow groundwater or soil gas adjacent to the Camdenton WWTP office building that could pose a risk to building inhabitants through the subsurface intrusion (SSI) pathway. A second question is whether TCE is present in groundwater beneath the CTPL near the bedrock surface where it could be an ongoing source to the deeper bedrock aquifer.

3.5 Inputs to Study Questions

The primary inputs required to address the principal study questions are:

- Soil logs documenting subsurface stratigraphy at the site.

- Concentrations of COCs in soil gas and shallow groundwater near the WWTP office building.
- Concentrations of COCs in groundwater at the bedrock surface.
- Health-based screening levels for COCs in soil gas and groundwater (Table 1).

Table 1. Vapor Intrusion Investigation Screening and Action Levels, Non-Residential

Compound	Soil Gas		Groundwater ug/l
	Screening Levels[1], ug/m	Action Levels[2], ug/m	
Trichloroethene (TCE)	100	290	7.4
cis-2,1-Dichloroethene	NA	NA	NA
trans-2,1-Dichloroethene	NA	NA	NA
1,1-Dichloroethene	29,000	29,000	820
Vinyl chloride	93	930	25

[1] Screening levels based on lower of cancer (1E-6) and non-cancer risk (HQ=1). All values obtained from EPA VISL webpage calculator (https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-levels-visls, accessed October 2018)

[2] Action levels are based on lower of cancer (1E-5) and non-cancer risk (HQ=1)

[3] Using an Attenuation Factor of 0.03

3.6 Study Boundary

Sampling will be limited to the area immediately surrounding the Camdenton WWTP office building. If significant subsurface contamination is identified, the investigation may be expanded. In that event, the scope and nature of the additional assessment will be described in a separate SAP amendment.

3.7 Decision Rules

If soil gas or shallow groundwater COC concentrations exceed the Table 1 VISL levels near the WWTP office building and indicate that the SSI pathway may be complete, access will be

requested to conduct subslab vapor and indoor air sampling as part of a subsequent phase of the SI (under an addendum SAP); otherwise no further assessment will be conducted. If COCs are present above screening levels in groundwater at the bedrock surface, additional groundwater characterization may be conducted as a separate phase of the SI under a SAP Addendum.

3.8 Tolerable Limits on Decision Error

The hypothesis of this investigation is that TCE and daughter products in soil gas are posing a health threat to inhabitants of nearby buildings through the vapor intrusion pathway. Falsely rejecting that hypothesis, considered a Type I decision error, would mean mistakenly concluding that the subsurface contamination does not pose a health threat. Falsely accepting this hypothesis, considered the Type II decision error, would mean concluding that the subsurface contamination poses a health threat when in fact it does not.

The Type I error could result in concluding that no action is necessary to reduce exposure when in fact the subsurface contamination is posing a health threat. A Type II error would potentially result in the recommendation for removal or remedial actions at the site which may not actually be necessary to protect public health. The Type I error is considered more severe since it could result in delaying actions needed at the site to protect public health.

Several measures will be taken to reduce the probability of making a Type I decision error. The use of a multiple lines of evidence approach will reduce the likelihood of committing either type of decision error. Results will be compared to EPA's vapor intrusion screening and action levels (VISLs) which are established using conservative toxicity, contaminant transport and exposure assumptions, further protecting against Type I errors. An exceedance of screening levels in either the deep or shallow soil gas will trigger additional assessment, even though deeper soil gas

results may overestimate potential risk in that it may not be representative of what could be present directly beneath a structure. This provides additional protection against Type I errors.

3.9 Sampling Design

Groundwater and soil gas migration are strongly controlled by subsurface conditions. Soil cores will be collected and logged to document these conditions and identify whether a shallow saturated zone is present. Soil gas data will be collected from deep (~20 feet or just above the saturated zone) and shallow (6 feet) depths to evaluate potential vertical attenuation. Results will be compared to EPA VISL screening levels established for subslab vapor. If exceedances are detected, access will be requested from the property owners to conduct subslab vapor and indoor air sampling to further evaluate the pathway. Groundwater will be sampled from near the top of the saturated zone in the overburden (if encountered) and from near the bedrock surface.

4.0 Field Activities

4.1 Sample Collection

Sampling activities will include the collection of soil cores, shallow groundwater and soil gas samples. Locational information will be collected for each sample using a Trimble GeoExplorer GPS and the data will be differentially post-processed.

4.1.1 Soil Cores

The proposed soil gas sampling locations are shown in Figure 2. At one of the locations, two-inch diameter soil cores will be collected using direct push technology. Cores will be collected in PVC Macro-Core liners at five (5) foot intervals from the surface to refusal. The cores will be screened for volatile organic compounds using a photoionization detector (PID). After removing each core sleeve from the rod, small diameter holes will be punched through the sleeve at 1 foot intervals, and the PID wand inserted into the core to collect a reading. The sleeve will then be cut open and the soil core logged.

4.1.2 Groundwater

At the same location where soil cores are collected, if high soil moisture conditions are observed indicative of a saturated zone, an attempt will be made to identify the depth to groundwater and collect a groundwater grab sample from near the top of the groundwater surface and another from near the bedrock surface. Following completion of the core logging, a five (5) foot section of slotted Schedule 40 PVC well screen will be lowered into the open boring and connected with solid sections of pipe up the ground surface. A water level probe will be used to record the depth to water below ground surface. If water is present, disposable ¼ inch polyethylene tubing will be lowered into the well screen and the well will be purged using a peristaltic pump. Three (3) borehole volumes of water will be removed at a rate of less than 500 ml/min. Groundwater will be screened for temperature, pH, and specific conductivity during purging. Readings will be collected every three minutes and once field measurements have stabilized (pH within 0.2 units, temperature and specific conductivity within +/- 10%), samples will be collected for laboratory analysis.

In the event that the open borehole collapses preventing the insertion of a well screen, shallow groundwater will be obtained using a screen point sampler. A second boring will be advanced a few feet from the soil core boring location using DPT and a Geoprobe® Screen Point 16 Groundwater Sampler. After advancing to the desired depth, the expendable rod drive tip will be released and the rods will be retracted approximately four (4) feet to expose the screen point sampler to the formation. A water level probe will be used to record the depth to groundwater below ground surface, and disposable ¼ inch polyethylene tubing will be inserted to the approximate depth of the screen point sampler. The boring will be purged and sampled as described above. Following sample collection, the boring will be plugged with granular bentonite and hydrated.

4.1.3 Soil Gas Sampling

Soil gas samples will be collected from two depths at four locations around the perimeter of the WWTP office building (Figure 2). Soil gas samples will be collected using DPT and a post-run tubing (PRT) system. Sampling depths will be determined based on observations made during soil core logging and shallow groundwater sample collection described above. An attempt will be made to collect a deep soil gas sample from just above the saturated zone if encountered, to a maximum of twenty (20) feet below ground surface, or from near refusal if encountered first. A direct push rig will be used to advance rods equipped with an expendable drive point to the target depth. The tip will be released and the rod string pulled back to expose a 1 foot interval of soil. Post-run tubing equipped with a threaded adaptor will be inserted through the rods and screwed into the expendable point holder at the end of the rod string forming a gas-tight seal. Hydrated bentonite will be placed around the rod at the ground surface to prevent intrusion of atmospheric air into the rod string. The dead volume of the tubing will be calculated based on tube diameter and length, and three volumes will be evacuated to purge the sampling point using a 100 ml plastic air tight syringe attached to the tubing with a three way valve.

Prior to collection of each soil gas sample, a leak check will be conducted. A shroud will be placed on the surface around the rod and bentonite seal and ultra-high purity helium will be introduced into the shroud to a concentration of 60% or greater. Using a 100 ml air tight syringe, soil gas will be collected and analyzed with a portable helium detector. A result of less than 1% of the initial helium concentration in the shroud will indicate a sufficient seal against intrusion of atmospheric air into the sample. Following a successful leak check, a 1-liter evacuated Summa canister will be attached to the post-run tubing and a soil gas sample collected at a rate of approximately 100 ml/min. Immediately following sample collection, the rods will be retracted, the boring plugged with hydrated bentonite, and the surface restored to the extent practical.

After collection of the deep soil gas sample, a second boring will be advanced approximately three (3) feet away to five (5) feet below ground surface and a shallow soil gas sample will be collected as described above.

Saturated soil conditions prevent collection of soil gas samples. Saturated conditions will be indicated in the field by soil core observations and difficulty experienced in purging and collecting soil gas. In some conditions, water can be observed in the tubing during purging or sample collection which will prevent sample collection. If such conditions are encountered, the rods will be retracted at intervals until soil conditions amenable to sampling are observed.

4.2 Sample Nomenclature

Soil gas samples collected from soil boring locations will be named using the following format; SG-xx-yy, where xx is the boring number starting with 01 and yy is the depth the expendable rod tip is driven to. Groundwater grab samples will be named GW-xx-yy, using the same convention as soil gas.

4.3 Sampling Order

The soil core logging and groundwater grab sampling will be conducted first. Soil gas samples will be collected in no particular sequence after that.

4.4 Sample Analysis

Groundwater samples will be submitted to the Department's analytical laboratory in Jefferson City for analysis of volatile organic compounds by EPA SW-846 Method 8260B. Soil gas samples will be submitted to Eurofins laboratory in Folsom California for analysis of TCE, 1,1-dichloroethene, cis- and trans- 1,2-dichloroethene, and vinyl chloride by EPA Method TO-15 (full scan). Selected ion monitoring will be requested on the outdoor air sample in order to

increase the sensitivity. The minimum sensitivity requirements for samples submitted to the laboratory analysis are provided in Table 2.

Table 2. Minimum Sensitivity Requirements for Lab Analysis

Compound	Groundwater, ug/l	Soil Gas, ug/m^3
cis-2,1-Dichloroethene	5	10
Trichloroethene (TCE)	5	10
1,1-Dichloroethene	5	10
trans-1,2-Dichloroethene	5	10
Vinyl chloride	5	10

4.5 Number of Samples, and Container and Preservation

One or two groundwater samples and a duplicate will be collected. Approximately 10 soil gas samples will be collected including an equipment blank and field duplicate. Groundwater will be collected with no headspace into 40-ml amber vials with Teflon lined caps, preserved with HCL to a pH below 2 and stored on ice until submission to the laboratory. Groundwater sample holding time limit is 14 days from collection. Soil gas samples will be collected into 1-liter evacuated Summa canisters which require no preservation and also have a holding time limit of 14 days.

4.6 Chain-of-Custody

All samples submitted for laboratory analysis will be entered onto chain-of-custody forms which will accompany samples shipped to the laboratory (Appendix C).

5.0 Quality Control (QC)

Field Sampling quality control measures described in SOPs ESP_CAS-2090, MDNR-ESP-210 and ESP-ESP-213 will be followed during sample collection as further described below.

5.1 Field Decontamination

Clean disposable latex gloves will be worn by sampling personnel and clean or field decontaminated equipment will be utilized for each sample location to minimize the possibility of cross-contamination. The following procedure will be used to decontaminate Geoprobe boring rods between sampling locations.

- Brushing with stiff-bristle nylon brush to remove visible soil debris;
- Cleaning with Simple Green® or Liquinox solution detergent and further brushing;
- Rinsing with DI water; or alternatively due to large volume required, the Geoprobe tooling will be rinsed with plain potable water
- Wiping dry with clean paper towels

5.2 Quality Assurance/Quality Control (QA/QC) Samples

The following samples will be collected as part of the quality control/quality assurance procedures for the investigation.

5.2.1 Trip Blank

A trip blank will be used to estimate bias due to cross-contamination during sample storage and transport. One set of water trip blanks will be transported to the site and returned for VOC analysis.

5.2.2 Collocated Samples

At one deep soil gas sampling location, a collocated soil gas sample will be collected. A second boring will be advanced to the same depth approximately 3 feet apart and soil gas collected into a separate 1L Summa canister.

5.2.3 Laboratory QC

Laboratory precision and accuracy will be assessed as described in the QAPP for Pre-Remedial/Pre-Removal and Targeted Brownfields Site Assessments Revision 8, December 29, 2017 and ongoing.

6.0 Investigation Derived Wastes (IDW) Plan

Efforts will be made to minimize IDW generation. IDW may include groundwater, equipment decontamination fluids, disposable sampling equipment, and disposable personal protective equipment (PPE).

Field personnel will containerize soil cores and transport them to the ESP laboratory for proper disposal. Disposable PPE and disposable sampling equipment will be handled as solid waste, containerized, and properly disposed. Groundwater purge water and wash and rinse waters generated during equipment decontamination will be discharged to the ground surface.

7.0 Site Safety

A safety briefing will be held on-site prior to initiating field activities and field personnel will be required to read and sign the site-specific health and safety plan included as Appendix B.

8.0 Reporting

ESP will prepare a Sampling Report including a copy of the field notes, chain of custodies and laboratory result sheets. SAU will prepare a Site Inspection Investigation Report.

REFERENCES

MDNR, 2017 — Missouri Department of Natural Resources, QAPP for Pre-Remedial, Pre-Removal and Targeted Brownfields Assessments, December 29, 2017.

CITCAT, 2017 — Camdenton Industrial TCE Contamination Advisory Team (CITCAT), Meeting Notes, March 14, 2017.

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SIGNATURES

Prepared by:

Michael Stroh
Environmental Scientist
Site Assessment Unit
Hazardous Waste Program

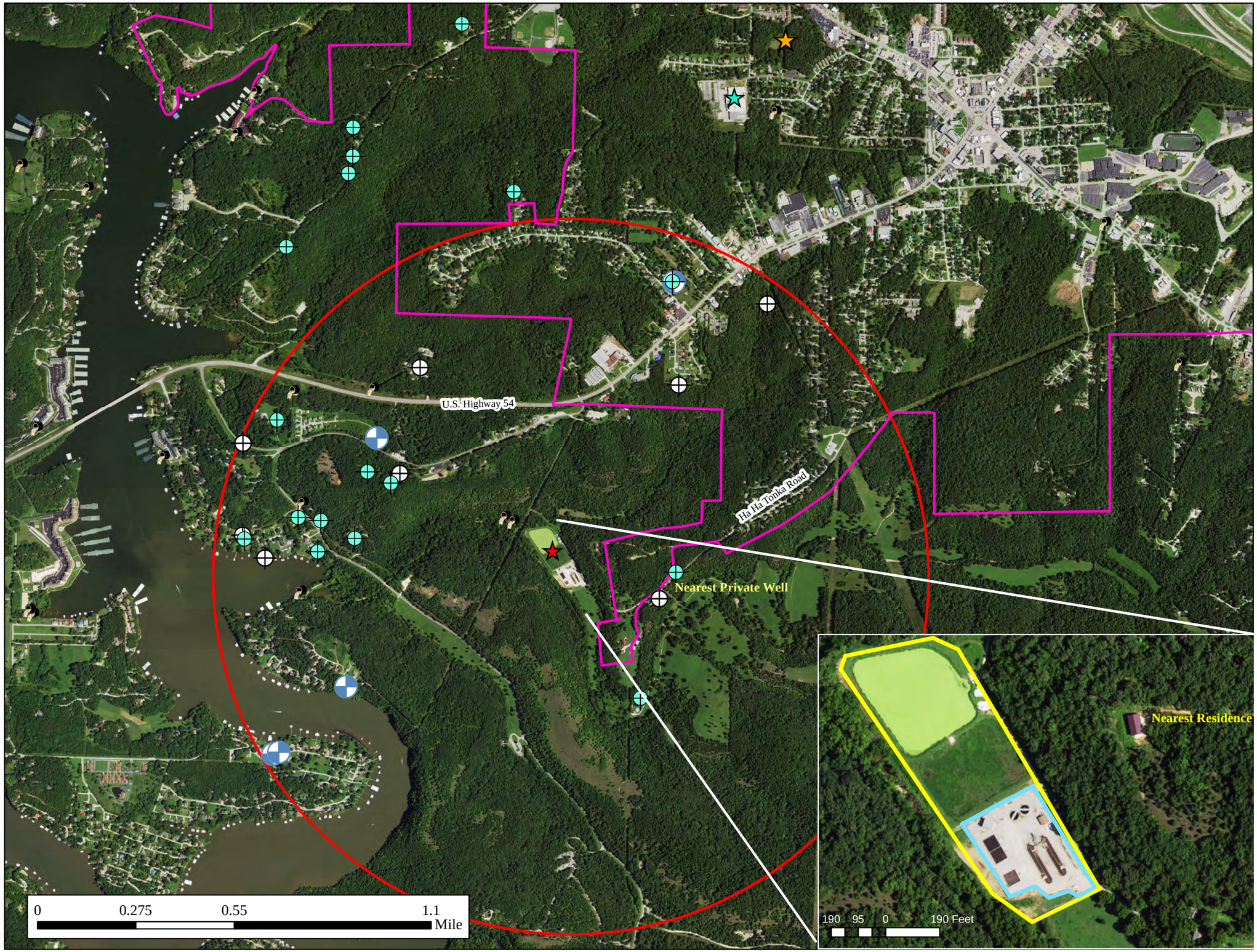
Sean Counihan
Environmental Specialist
Field Services Unit
Environmental Services Program

Approved by:

Martin Kator
Unit Chief
Site Assessment Unit
Hazardous Waste Program

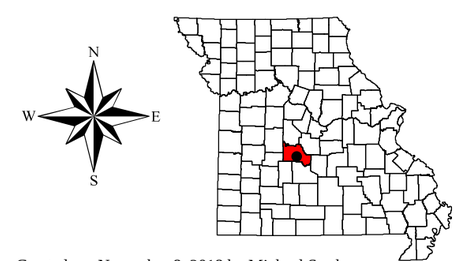
Date: December 17, 2018

Figure 1: Site Location Map
Camdenton Treatment
Plant Lagoon
Camden County, Missouri



Legend

- Public Wells Within 1 Mile of Site
- Private Wells Sampled in 2017 (Dawson #2 Site)
- Private Wells in MGS CERT Database
- NPDES Outfalls
- Camdenton Treatment Plant Lagoon
- City Lagoon #3
- 221 Sunset Drive Facility
- Former CTPL Lagoon Boundary
- Camdenton WWTP
- Camdenton Municipal Boundary



Created on: November 8, 2018 by Michael Stroh.
This map is located at M/Superfund/Camdenton Treatment Plant Lagoon/Figure1 Site Location Map
Base Map: National Agriculture Imagery Program (NAIP) ortho photography. Flight Date: 2014
Data Sources: US Census 2010;
Missouri Department of Transportation

MISSOURI DEPARTMENT OF NATURAL RESOURCES

Figure 2: Proposed Sampling Locations
Camdenton Treatment Plant Lagoon
Camden County, Missouri

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL SERVICES PROGRAM

SITE HEALTH AND SAFETY PLAN

1.0 INTRODUCTION

This plan has been prepared for implementation by DNR employees, using operating procedures for which they are specifically trained. Any use of the plan by other agencies, organizations, or private individuals is at their own risk.

2.0 KEY PERSONNEL

MDNR OSC: Sean Counihan SAFETY OFFICER: Sean Counihan

OTHER MDNR PERSONNEL/TITLE:

Ken Hannon, Environmental Specialist; Ethan Musick, Environmental Specialist

Caleb Troutt, Environmental Specialist

Andy Stivers, Environmental Specialist

Michael Stroh, Environmental Specialist

3.0 SITE INFORMATION

Site name Camdenton Treatment Plant Lagoon site County/City: Camden/Camdenton

Sampling date: December 19, 2018 Site Description: The CTPL site is a former city of Camdenton WWTF lagoon and received waste water from the facility at 221 Sunset Drive that had documented releases of TCE and contamination to its wastewater/effluent. The wastewater from the facility was rerouted to this site for a short time and it is proposed that this former lagoon received waste water that was contaminated with TCE.

3.1 Overall Incident Risk/Hazard Analysis

Chemical:	____ Serious	____ Moderate	X Low	____ Unknown
Physical:	____ Serious	____ Moderate	X Low	____ Unknown

3.2 Contaminant(s) of Concern: TCE and its breakdown chemicals.

3.2.1 Physical State: X Liquid X Solid ____ Sludge X Gas/Vapor

Chemical Characteristics: (check all that apply)

X a. carcinogen	____ b. biological	____ c. corrosive	X d. combustible
____ e. explosive	X f. flammable	X g. volatile	X h. poison
____ i. radioactive	____ j. reactive	____ k. other: ____	

3.2.2 Physical Hazards: (check all that apply)

a. __X__overhead _____b. below grade _____c. confined space*X__X__d. noise
e. __X__splash _____f. fire/burn _____g. puncture __X__h. heat stress
i. __X__cut __X__j. slip/trip/fall _____k. cold stress _____l. electrical
m. __X__mechanical/heavy equipment _____n. other:_____

* The need for confined space entry by ESP personnel shall be evaluated on a site-by-site basis. A confined space entry permit must be signed by the appropriate Unit or Section Chief prior to ESP employees entering a confined space (29 CFR 1910.146). Confined space entry shall be screened in at least Level B prior to downgrade. **Adequate resources must be available and specific planning and tasks determined before confined space entry is initiated.**

3.3 Task-Specific Risk Analysis (attach additional sheets as necessary)

Task Description	Chemical Hazards	Physical Hazards	Level of Protection
Groundwater/soil boring Sampling	a d f g h	a d e h i j m	D
Private well & spring sampling	a d f g h	a h j	D
Air/subslab Sampling	a d f g h	a d h i j m	D

4.0 MEDICAL SURVEILLANCE AND PERSONNEL TRAINING REQUIREMENTS

All ESP field personnel participate in a medical monitoring program and are trained at least to the level of "Hazardous Substance Emergency Response-Technician" as required and specified in the department's written health and safety program located in Section 2 of the MDNR-Hazardous Substances Emergency Response Plan (HSERP). The written policy satisfies requirements set out in 29 CFR 1910.120. MDNR ESP's respiratory protection program meets the requirements of 29 CFR 1910.134.

ESP personnel will ascertain as much information as possible regarding health and safety issues associated with the site prior to initial entry. Information shall include chemical and physical hazards as listed above, types and amounts of materials involved, and citizens/areas threatened by the incident.

5.0 PERSONAL PROTECTIVE EQUIPMENT

ESP shall utilize the Protection Level categories defined in 29 CFR 1910.120, Appendix B, and known as Levels A, B, C, and D. Refer to Section 2 of the MDNR-HSERP for definitions of Protection Levels. ESP personnel shall inspect APRs and SCBAs at least monthly and maintain a record of such to ensure equipment is functional.

Levels of protection shall be reassessed and upgraded as conditions change and information is updated to comply with worker safety while performing site activities.

Action Levels for evacuation of work zone pending reassessment of conditions:

Level D: O_2 < 19.5% or > 25%; explosive atmosphere > 10% LEL; organic vapors > background levels; other_____.

Level C: O_2 < 19.5% or > 25%; explosive atmosphere > 20% LEL; organic vapors (in breathing zone) > 5 m.u.; other _____.

Level B: O_2 Explosive atmosphere > 20% LEL; unknown organic vapors (in breathing zone) > 500 m.u.; other_____.

Level A: ESP personnel shall evaluate the need for entry on a site-specific basis and may utilize its emergency response contractor for Level A situations which may arise.

6.0 FREQUENCY AND TYPE OF AIR MONITORING/SAMPLING

Instrument	Contaminant of Concern	Sample Location (Area/Source)	Frequency	Odor Threshold/ Description
N/A				

7.0 SITE CONTROL MEASURES

7.1 The "Buddy-System": ESP personnel performing any work activities within the exclusion zone shall employ the "buddy-system" at all times, as required and defined in Section 2 of the MDNR-HSERP. The "buddy-system" may not be required while an ESP staff member is observing or providing oversight of cleanup activities performed by a contractor or responsible party.

7.2 Safe work Practices: Refer to Section 2 of the MDNR-HSERP for written safety practices to be followed at all times by ESP personnel while on-site at an incident.

7.3 Site Communications: The use of two-way radios or establishment of hand signals for communications shall be determined prior to entering the work zone and followed by ESP personnel.

7.4 Radiation Safety: Due to the possibility of an unknown radiation hazard being present on a site, ESP personnel shall be required to wear radiation indicator badges (TLD badges) while on-site.

7.5 Work Zones: ESP personnel shall ensure work zones are established and be aware of their locations.

8.0 DECONTAMINATION PROCEDURE/SOLUTIONS:

Personnel: Gloves and clothing will be placed in a garbage bag and returned to Jefferson City for proper disposal.

Equipment: Returned to Jefferson City for proper decontamination or field decontaminated.

Instruments: Returned to Jefferson City for proper decontamination or disposed of back in Jefferson City.

Decontamination fluids/materials may be to be containerized for proper disposal or discharged to the ground.

9.0 EMERGENCY INFORMATION:

In the event of an emergency, notify the MDNR Environmental Emergency Response Office at 573/634-2436. The Duty Officer will make the appropriate notifications.

10.0 ADDITIONAL EMERGENCY INFORMATION/NUMBERS:

Hospital: Lake Regional Hospital, 54 Hospital Drive, Osage Beach, MO 573-348-8000

Location/Specific directions from Site: See attached map

	Name/Location	Telephone Number
Ambulance:	Camden Ambulance District	911
Police/Sheriff:	Camdenton PoliceDepartment	911
Fire:	Camdenton Fire Department	911

Poision Control:

Cellular Telephones/Other:

1) Central Accident Reporting Office- WORK RELATED INJURY 1-800-624-2354

This number is to be called in the event of a NON LIFE THREATENING injury PROIR to seeking medical care.

11.0 SIGNATURES

ESP personnel shall certify they have read the plan and addressed any questions regarding worker health and safety by signing and dating below followed by printing their name and title.

Signature	Printed Name/Title	Date	TLD Badge